THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XVI. No. 373—19th YEAR.] LONDON, FEBRUARY 5, 1867. [Subscription per Ann. { 15s. in Advance / 18s. Credit } Price 6d. Unstamped.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis by Dr. FYFE, M.D.:—
9746 cubic feet of gas per ton of coal.
26-candle gas.
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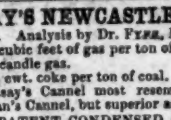
1862.



CLASSES X. AND XXXI.

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3. Escapes of gas through the plugs being left out, or imperfectly secured, when the Wet Meter has been replenished with water.
4. The gas passing without being registered at all.
5. The temptations and facilities to fraud which it is notorious the Wet Meter presents.

1862.

CLASSES X. & XXXI.

6. The damage to house property which the impracticable attempt to keep the lights from jumping, by giving all the pipes a gradual ascent from the Meter, so as to admit of the water trickling back into it, necessarily occasions.
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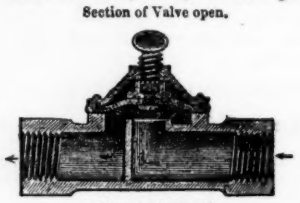

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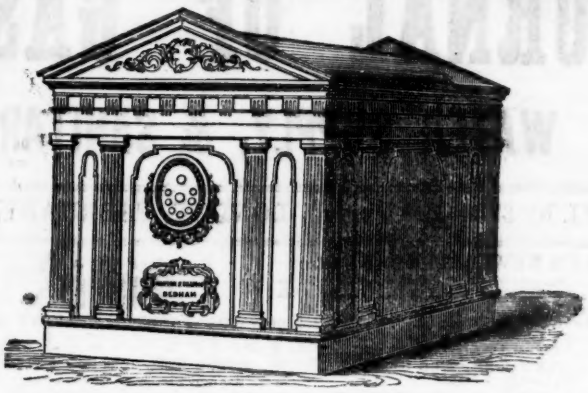

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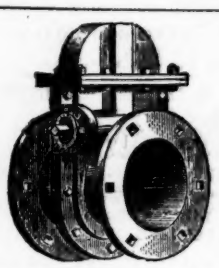

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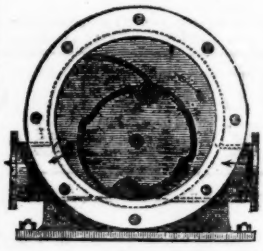

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☞ *See "Practical Mechanic's Journal," Dec. 1, 1865; also, p. 711 "Journal of Gas Lighting," Sept. 18, 1866.*

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THOMAS GLOVER has great pleasure in informing Gas Companies and his other Patrons, that the *Jury of Class XXXI. of the International Exhibition of* 1862 have awarded, for his Patent Dry Gas-Meter, *a Prize Medal.* The reason given for this Award, in the Juries Official Report, is, "*For excellence of manufacture, as regards Dry Meters.*" See Official Report, p. 346.

It is worthy of remark, that the only two other Firms who receive Awards *both manufacture imitations of Thomas Glover's* Patent Dry Gas-Meter, and the reason given for these Awards is "*construction* and sound workmanship." Thomas Glover, therefore, claims that the *construction* of his Meter has obtained *three Awards from the Jury of the International Exhibition of* 1862; at the same time, *contrasting* the Award granted for his Meter by the words, "*For excellence of manufacture, as regards Dry-Meters.*"

The Prize Meter was exhibited in Class XXXI., No. 6301, connected with a 1-foot holder, to demonstrate that a 50-light Meter *measures and indicates accurately the small quantity of One Foot.*

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Which can be seen at all the London Gas-Works. Also Liverpool, Manchester, Sheffield, Nottingham, Belfast, Glasgow, Birmingham, Dublin, Bristol, Leeds, Leicester, Brighton, Southampton, Sunderland, Wolverhampton, Bradford, Norwich, &c., &c.

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TO CORRESPONDENTS.

X.—*The ventilation of purifiers by the retort-shaft is a dangerous process, and has been the cause of repeated accidents. The operation is best conducted by mechanical means, such as fans or exhausters.*

NOTICES.

The subscription is 15*s.* per annum, if paid in advance during the month of January, or 18*s.* credit, in two sums of 9*s.* each, in July and January of each year. Post-Office orders must be made payable at the Charing Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, February 19, and the subsequent numbers on each successive alternate Tuesday.

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All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 5, 1867.

Notes upon Passing Events.

THERE are two sorts of fools who are an especial nuisance in discussing social and municipal evils:—The conservative fool, who says nothing can be done; and the destructive fool, who protests that everything can be done. The one sees nothing but difficulties; the other sees no difficulties in any change, not to say reform. The one would not move if up to the neck in a bog, for fear of being smothered; the other would burn a cornstack to warm the fingers and the toes of a tramp. The one is always saying "dangerous," "impossible;" the other is glib with "the easiest thing in the world. The wholesale drowning in Regent's Park waters has brought in relief both these classes of minds. The one says "*caveat* "skater;" the other says "let the police keep the people off "dangerous ice." Dr. Lankester is an improvement on the old attorney style of coroner, who knew nothing and wisely said nothing. Dr. Lankester really is able to guide the jury to the cause of death, and decide when more medical evidence is required. The work that he does best is never heard of out of parish newspapers, because he simply prevents jurymen from making fools of themselves—a process very common in the proceedings of this, on the whole, useful, but by no means infallible institution. The first inclination of a "crowner's-quest" jury is to chatter, and make up their minds when they have heard, perhaps, one and the least important witness. The doctor has a very neat way of leading them back into the paths of peace, if not pleasantness. And, by the way, when municipal halls or new police offices are built, it is a pity that a sort of dead-house or *morgue* could not be provided, where not only unowned bodies could be laid, but coroner's juries could assemble in decency, instead of in the stale smoking-rooms of public-houses. But Doctor Lankester, being a *doctrinaire*—a social science reformer of the Edwin Chadwick school—has opinions on every subject, and an overwhelming inclination to regulate all the world's affairs by law. The liberty he likes is the liberty of talking; but if it were left to his class to rule, there would be very little liberty left of eating, drinking, walking, riding, or clothing ourselves, without the permission of an official M.D., or some other "specially qualified" official, to use Mr. Chadwick's favourite term. Dr. Lankester has been laying down the law of public safety, in the true *doctrinaire* sense, on the occasion of the Regent's Park accident. He maintains that it is the duty of the Government to protect the public from the folly of skating or sliding on dangerous ice or bathing in deep water. If this sort of paternal duty is to be imposed on the police, it is quite certain that they must soon call in the aid of the military, and surround ice and water with a line of sentries, while the rest of London is left to the mercy of thieves and roughs. But if skaters and bathers are to be protected against their will, the principle should go further, and Government must teach us, and a police must enforce rules, as to what to eat, drink, and avoid, how to be clothed, and where to be amused. The fashionable raspberry-tart bonnet, and the too cheap saveloy, will both come under the ban of the law. To warn that danger exists is one thing, to protect people against possible danger is another. It has always been the system in this country that boys should learn early to take care of themselves, and there is no doubt that our success in far-away enterprises is very much due to the character produced by this training. But because public opinion will very certainly and very wisely resist any attempt to coerce skaters and sliders into safety, that is not a reason for total inaction. In respect to ice, it would be right if at all the public waters there were conspicuous notices when danger was to be apprehended. Something like poor Admiral Fitzroy's storm signal might be hoisted. Thus, for instance, at every entrance to the parks some sign more prominent than the black boards of the Humane Society could announce danger, and the same might be repeated at frequent intervals on the banks of the waters. Then few would venture, and the diminution of numbers would lessen the danger. At present it is no one's business to put these signals up, and few see, still fewer pay any attention to, the stereotyped notices of the Humane Society, which often remain up long after the ice is as safe as the land. On the same principle waters where the public bathe should have poles marking that the depth is more than 5 feet; all holes should be carefully filled up, and then with perhaps a boat in attendance the naked public should be left to take care of itself. The schemes for reducing stagnant, or nearly stagnant, waters to shallowness would render them putrid in summer, and unnavigable except by the shallowest of boats. After all, it is not possible to lower the depth of all the pools, rivers, and canals of the country. As far as bathing goes, it would be better to make swimming part of every one's elementary education. This is really one of the cases where prizes would have some useful effect. We commend the notion to the social science reformers.

It seems that since the snow storm the Conservators of the Thames have agreed to allow snow to be cast into the Thames, provided it is unmixed with road sweepings. This will certainly relieve the scavengers from one great difficulty, although, as already observed, in case of a severe frost and very active scavengering, the effect may be to stop navigation even below the bridges earlier than usual. At any rate, it is an experiment worth trying. The surveyor of the Holborn district tried with some success to get rid of snow through the sewers, but it was a very expensive operation.

The juries in compensation cases in the City seem to be rather moderating their ardour in the way of liberality, and perhaps, with the view of an improvement-rate *in posse*, are remembering that they may have to pay part of the damages they have been so freely awarding during the last three years. We notice in the full reports in the *City Press* that in one of the Post-Office Improvement cases a Mr. Wadmore claimed £5700, and was awarded £2550. In a case where the Metropolitan Board of Works was concerned, the claim was over £4700, and £3190 was awarded. In a second case, created by the new street into Bucklersbury, the claimant asked for £7700, and the jury awarded £2750.

The Duke of Beaufort rarely appears before the public except in his special vocation as a sportsman and country gentleman, but, fired by praiseworthy zeal to cultivate a good understanding between England and France, he has written to the *Times* to propose a mode of settling the offensive right-of-search question in a truly practical manner, although the very last we should have expected from a duke. From a City banker it would have been quite natural. His grace, who at present has not the slightest idea of the value of small sums, suggests that each visitor should have the option of paying £1 or 10s. to make his baggage exempt from search. If it were likely that half the travellers to Paris would pay the smaller sum, the arrangement would be a financial success; but we are afraid that the majority of travellers would consider it an unbearable tax. Indeed, the very persons who most suffer from the searching system are those who do not travel with servant or courier, and have to wait themselves to see the aggravating farce performed, and look at every half sovereign.

The decrees, or rather *ukases*, of trades unions continue to excite discussion, the more lively because an unusual degree of distress has brought out the curious contrast of thousands claiming parish relief and charity, while skilled workmen, whose work employs many labourers, are sticking out—mechanic Shylocks—for their pound of flesh. When we come to consider the question closely, we find this country in a strangely anomalous position as regards the laws and the rights of labour. England is the only country in Europe where the able-bodied out of work has an absolute claim to support from public funds. In all other countries it is a question of charity and of police. But England is also the only country in which trades unions are permitted to dictate whether those who do not belong to them, or who are forced to belong to them, shall be idle against their will. We have not only sanctioned perfect liberty of combination to raise the price of wages, but have permitted combination to settle the rules of trade, the quantity of work one man shall do in a day, &c. We have also not made any organized attempt to check a system of intimidation which forces nearly all skilled men into the union laws, and exercises a secret tyranny only paralleled by the Secret Society of Naples, called the "Camora." In a country like ours, where every kind of society—every kind of meeting—is legal, it would be useless to contemplate any penal laws to protect the workmen who wish to work for as much as they can get in bad times, from the moral and physical cruelty of the secret committees who say—"Get the highest wages of "our tariff, or go to the parish." But this cannot last, and when our workhouses have been so reformed that the sick, the imbecile, the aged, and the children, are better treated, some restriction must be put on the fatal law which makes the most improvident and insolently profuse in times of ample employment quite sure of parish relief the day after a dearth of work lowers the rate of wages.

A communication from the trades union of Sydney, New South Wales, has been lately published, in which we get a very good idea of the ultimate results of a working men's parliament. Working, as they had a perfect right to do, on the scarcity of skilled labour, the Sydney mechanics established a very high scale of wages, with short hours of work. But this paradise of mechanics cannot last, because high wages attract immigration, and dear goods attract importation. Besides, as mechanics are in turn consumers as well as producers, they have to pay dearly for what was cheap at home. The Sydney appeal to British workmen lays stress on the dearness, for instance, of fuel and house-rent. But when Australian coal-miners command what wages they please, and only work about 30 hours a week, fuel must be dear; and when bricklayers, carpenters, masons, &c., get double English wages, house-rent cannot be cheap. The grievance that these high wages are not certain all the year round is the natural result of the artificial rate to which they have been pushed. Two or three years ago the Sydney Trades Union achieved a complete triumph over the employers. Those who had work that could not wait paid; those Government officials who wished to stand well with the working-class voters did not haggle about wages, but paid liberally from the funds that cost them nothing. But, in time, the effect of the artificial enhancement of wages told on profits, and capital shrank from the investments dependent on the caprice of a small, compact, and all-powerful trades union. Capital employed in manufactures may be compared to a reservoir, fed by a 6-inch pipe of savings and profits. As long as the outlet-pipe which turns the wheel of labour is not more than 4 inches, 5 inches, or even 6 inches in diameter, the reservoir will be kept full, and the wheel will go steadily; but if the managers of the reservoir are forced or cajoled into making a 7-inch outlet-pipe—or, indeed, a pipe in the smallest degree larger than that which feeds the reservoir—at a certain time it will become dry, and the wheel of labour will slacken and stop. We observe that the Sydney Trades Union complains that a small cabbage costs 8d., and all vegetables are dear. Evidently growing cabbages cannot be a bad trade, and a small garden may be not only an amusement but a good living. So both Chinese and Germans have found, and thrived where high-waged Australian mechanics came to grief. The Sydney Trades Union has evidently a grievance in the importation of the goods manufactured in Europe, which they "came out to "make." The remedy is obvious: a protective duty. The iron-worker will have a duty on iron castings; the carpenter on doors, windows, and other made work; then the tailor and shoemaker, who support the workers in wood and iron, will claim to make their coats and shoes; and so the working men's parliament will commence to weave the network of protection that Huskisson, and Peel, and Cobden cut through with so much difficulty, and with such success, here first, and in the end in France. Really, trades-union politics do not present a very tempting aspect.

Mr. Bailey Denton has published "A Proposal for the "Supply of the Metropolis from the Higher Sources of the "Thames, in connexion with a Storeage of Surplus Waters." Mr. Denton's theory, as far as we can understand it, is as follows:—Every year a large amount of water is wasted; in times of rainfall the rivers are swelled and overflow their banks; thousands of acres are permanently or occasionally injured in value; crops of all kinds are spoiled, hundreds of acres of hay are carried away, and no one is benefited. These floods have been increased in severity and frequency by the extension of thorough drainage, and the evil will, in consequence be year by year more severe. Now this flood water, so mischievous at one time of the year, would be invaluable at another. Mr. Denton proposes to store it in convenient situations, and thus supply London without the necessity of travelling to Cumberland or Wales. Mr. Denton concludes by summing up his proposition as follows:—

1. It has been proved that large quantities of water, rising as springs and flowing as tributaries of the Thames, are lost by absorption as they pass over the beds of free soil, forming the outcrop of the water-bearing strata of the oolite; and it is believed that water once disappearing from these surfaces, and passing underground by the dip of the strata eastward, does not again reappear within the London basin unless thrown out by a fault, and that having soon obtained a great depth below the covering strata, is lost for all possible use. This loss, in the aggregate, is very great. Mr. Simpson's gaugings of one of the Thames tributaries (the Churn), in 1859, discovered that 3 millions daily were lost in the course of that river by absorption, and the attendant facts go some way to show that the absorbed water is entirely lost to the river. At Thames Head, 3 millions of gallons are already pumped out of the Thames basin and thrown into that of the Severn; and there can be no doubt that, by multiplying the pumps at points distant from each other, a much larger supply may be obtained.

2. Again, in making due provision for the drainage of the clay land districts within the watershed a large addition of perennial water may be gained. Under-drainage as a means of discharging the water, which would otherwise be evaporated, is, in itself, a means of augmentation, and under proper control, in connexion with storeage reservoirs, may become a means of reducing floods, and of rendering the river flow both more copious and more regular.

A glance at the accompanying map will satisfy the observer that at least 1 million acres out of the 3 millions constituting the whole Thames Basin,

are of a character to require under-drainage, if not already drained, and that from such an extent water will be discharged into the valleys during the winter after drainage, which before rested on the surface for want of outfall until it was evaporated. This extent of drainage it may take fifty years and more to accomplish, but no one doubts that the whole will be done, and that we are experiencing the effects of that which has been already done. Three inches of water discharged over a million of acres if utilized would in itself yield a supply three times in amount the quantity now taken from the river at Hampton, and as 180,000 acres have already been systematically under-drained within the Thames Basin, there has already been placed at disposal from this source alone more than half the quantity required. *But this addition to the river supply is now allowed to swell the floods in winter, instead of being preserved by storeage for use or compensation in summer.*

3. If 3 inches, or about one-eighth of the rainfall, be taken as the perennial supply of the Upper Thames, 560 millions of gallons, flowing over Teddington Weir, becomes the mean or standard volume of the main river at that spot, from which nothing can be taken without reducing its natural service. The number of days in which the flow of the river is reduced below this mean may be taken at 100, and the remaining 265 days of the year will exhibit a surplus. The smallest quantity that has been known to pass over Teddington Weir has been variously stated at from 300 millions to 400 millions of gallons per diem. Taking, however, 100 millions to be the mean daily deficiency of the 100 days, 10,000 millions of gallons will be the surplus of the perennial supply spread over the remainder of the year, which now goes to increase floods, and which would be available for direct supply to the metropolis, or for compensation, if stored. Were this portion of the perennial flow so turned to account, we should gain a body of water sufficient to supply 28 millions of gallons per diem throughout the year, or the full quantity of 85 millions for one-third of the year.

The reservoirs to be constructed would partake of two characters—those for the collection of surface water for direct use, of capacity and depth favourable for purity, and those for the collection of flood waters for compensation only. The former would be constructed in those lateral valleys where soil, shape, and height are favourable for the purpose. In some instances the latter, too, may be made in like situations, within easy reach of the rivers or canals. In other cases they may be made by widening and embanking the river courses for a length and breadth sufficient to retain an equivalent for the pure water abstracted for domestic supply immediately above. As in the matter of compensation quantity is an object of more importance than quality, depth of storage is not of so much moment as the collection of surplus water in the readiest and cheapest way. This may frequently be accomplished by widening and raising a mill-head, and converting it into a reservoir of 200 or 300 acres in extent.

The extent of storeage room that would be necessary to accomplish the system here pointed out would he 1000 acres, of a mean depth of 20 feet, for the collection of water for *direct* supply; and 2000 acres, of a mean depth of 10 feet, for compensation.

The head of the proposed works would be the fork formed by the Thames and Severn Canal (extending from its summit at Thames Head to its junction with the Thames at Lechlade) and the North Wilts Canal. The Thames and Severn Canal does not pay to work. It would be necessary to purchase these canals, and, by rebottoming, convert them into impervious conduits for the collection of pure water from the upper portions of the Churn, the Swill Brook, and the river Ray, and of such additional water as may be obtained by the restoration of the 3 millions of gallons which now runs into the Severn, as well as by additional pumping at spots, distant from each other, along the line of oolitic outcrop, whereby a considerably increased amount may be gained, which would otherwise be lost.

From Lechlade to the meadows just below Oxford (where it would be desirable to have a supply reservoir), a channel would be formed following the course of the Thames—paved with concrete, and embanked so as to allow of the utmost cleanliness, and prevent the influx of surface drainage and flood water—which would act as a receiving conduit for the pure water to be furnished by the several tributaries which it will cross and meet on its way.

The tributaries that would be crossed and met would be the Ampney Brook, the river Colne, the river Cole, the river Leach, the river Windrush, the river Evenlode, with the river Glynne, and the several minor streams which join the Thames above Oxford. At Oxford the receiving main would join the supply to be gained from the Cherwell and branches above the point of pollution, as well as by storeage in reservoirs formed in the higher lateral valleys for direct supply. From the supply reservoir at Oxford, another paved conduit would convey the water by Abingdon to a point near Wallingford, having received contributions of supply from the Ock and the Thame. From thence to Hampton the water thus collected would be delivered to the water company's works by a *covered* channel, having received in its course the contribution of the Kennet River, the Lodden, the Colne, and certain springs rising near the main river, making up in the whole a supply of 80 millions of gallons daily. Oxford, Abingdon, Wallingford, Reading, Windsor, and the towns and villages on the banks of the rivers would have been previously supplied from the conduit as it passes by them to the amount of upwards of 5 millions of gallons daily.

On the Lea, of the lower Thames, a similar though reduced system of works would be carried out.

The cost of the whole may be estimated at £4,500,000, including interest on money expended and attendant expenses.

To place the present project, however, on the same footing as those which are designed to take their supply from the mountain ranges of Wales and Cumberland, it is right to state that the promoters of these distant schemes propose to deliver their supply at a height sufficient to command a high and constant service for nearly the whole of the metropolis; whereas, in the present instance, it is simply intended to deliver the water collected to the existing companies, and leave it to them, or a central body, to distribute with the *existing* machinery and appliances.

Against the annual cost of lifting the supply to existing reservoirs, the expense of rearranging the whole system of service piping will form no inconsiderable set off.

Mr. Denton's scheme has two points in its favour—it will fit the existing arrangements of supply, and it will remedy the serious and increasing evil of floods from the upper Thames. But no scheme will give satisfaction that does not include constant supply. The sooner the water companies accept that conclusion the better for their safety against outside attacks.

There has been a discussion on the evils of the licensing system, and the best way of limiting the number of public-houses, which was not practical because the most vehement speakers were those who would put down all drinking of alcoholic liquors, and we might just as well discuss the means for making the army efficient with a party of Quakers. A sensible Nonconformist divine, who wished to improve the music of piety, once observed that he saw no reason why the devil should have all the best tunes. A large order of pious people insist that everything light, bright, and cheerful, shall be given up to the devil. The public-house is the working-man's club, where he goes to a warm, gay, cheerful scene, to meet his friends and enjoy his chat away from the court and close room where he lives. If, instead of the hopeless task of endeavouring to limit the licensing of public-houses, an endeavour were made to put down ill-conducted houses, some real good would be done. We want summary justice—an information, a trial before a magistrate, a conviction, and the forfeiture of a licence there and then. At present, after a public-house has been abominably managed, the owner of the house has many chances of a renewal in one shape or another. All attempts to rival the attractions of public-houses by working men's clubs where no beer is to be consumed are simply ridiculous. All London cannot show amongst the wealthy one temperance club. Good people fail continually in their philanthropic gatherings because there is too much preaching, no fun, and no beer.

Mr. Göschen the other day made a "good boy" sort of speech in delivering the prizes of the Metropolitan and Provincial Working Men's Exhibition, which was visited by nearly half a million visitors in ten weeks, but he altogether missed the points that made the exhibition successful. The working classes were admitted for twopence each to a hall of two acres, well lighted, and filled with such things as you see at a cheap bazaar. With the exception of a few models, as an exhibition of art and science it was ridiculous; but there were sewing-machines at work, printing-machines, turning-lathes, and a few other machines. But there were also swings, and roundabouts, and weighing-machines; the organ played from time to time, and amateur bands gave a great deal of big drum. On the grand nights amateur choral societies sang with admirable effect. But not one-tenth of the visitors went to hear merely the music or to examine the curiosities—the mass went to hear a little music, look at this or that article, but chiefly to be amused by the cheerful crowd, where a glass of beer was to be had, and there were no rules or regulations, or compulsory prayers or hymns. Those who liked sat still and listened to the choruses or the police band; those who preferred walked about, nursed their babies, and rode in the roundabouts. It was a great twopenny *conversazione*, where the vast space and light secured good behaviour. Although there were half a dozen beer bars, and every opportunity to drink, the crowd was as orderly as if it had been at South Kensington Museum. Social reformers may, when considering the public-house question, study this Agricultural Hall *conversazione* with advantage.

Circular to Gas Companies.

We intimated, in a previous number, that the Government had invited the metropolitan gas companies to consider the resolutions of the Metropolitan Board of Works, and to communicate their views on the subject; and, at the same time, we expressed the hope that they would make their case complete, so as to present it fully to the Government. We have much satisfaction in stating that they have done so. The correspondence between the Board of Trade and the gas companies, in reference to the proposals of the Metropolitan Board of Works, is now before us, and it presents so complete an answer to the propositions of the Board, that it cannot fail to expose their injustice. The correspondence consists of three parts. The first relates directly to the propositions of the Metropolitan Board; the second, to the concessions which the companies are willing to make; and, lastly, there is a statement of the gas companies as to the supply of gas in provincial towns. In dealing with the proposals of the Board, the gas companies very properly protest, in the first instance, against any interference at the dictation of that Board with property which was founded on the principle of private enterprise, and has been sanctioned by numerous Acts of Parliament, and which is now held on conditions settled, after three years parliamentary investigation, by the Metropolis Gas Act of 1860. It is well observed, that the London gas companies had to encounter all

the risks incident to an entirely new system of lighting, and have consequently had to incur an outlay of capital in excess of what might be sufficient for companies formed with the benefit of their experience; and that it is only when, after having surmounted all difficulties, and a profit appears no longer doubtful, that the municipal bodies of London desire to undertake the supply of gas. To the proposal of the Metropolitan Board, that the companies should be required to furnish gas at the maximum price of 3s. 6d. per 1000 feet, and with an illuminating power of 18 candles, the companies reply by submitting a report received from a committee of their engineers, consisting of five, as to the increased cost of manufacture which would result from the adoption of a minimum illuminating power of 18 candles, which fully confirms our previous statement that it would be equal to 1s. 2¾d. per 1000 feet, without taking into consideration the almost certain advance of the price of cannel. Assuming the increased cost to be 1s. 2d. per 1000 feet on the quantity of 10,440 million cubic feet of gas per annum now made by the London gas companies, it would amount to the annual sum of £609,000; the reduction of another 6d. per 1000 feet on the quantity *sold*, which is estimated in round numbers at 9000 millions of cubic feet, would amount to £225,000; so that the combined result of the additional expense in raising the illuminating power and of the reduction of price would be equal to an annual loss of £834,000. The net profits of all the metropolitan gas companies were represented by the last parliamentary return to be £678,935; so that, by the adoption of the course proposed by the Metropolitan Board of Works, not only would every shilling of profit be annihilated, but there would be an annual deficit of £155,014. Nothing could more forcibly show the impracticability of adopting the course recommended by the Metropolitan Board of Works than these facts and figures—putting aside all consideration of its injustice—and it only requires that they should be clearly established to prove to the Government the recklessness of the assertions made by the opponents of the gas companies. The main point on which those statements rest is the subjoined report of the committee of five engineers of some of the principal metropolitan gas companies, most of whom have been for years engaged in manufacturing both common and cannel gas. Their names are ample guarantee of the trustworthiness of their report:—

18-Candle Gas.

Estimate based on the experience of the year 1866 of the cost of making 1000 cubic feet of gas, having a minimum illuminating power of 18 sperm candles, the items including merely the cost of coal and fuel for carbonizing, the amount realized by the sale of coke, tar, breeze, and liquor being deducted.

All other expenses of wear and tear, management, rates, taxes, &c., being altogether omitted from this estimate, as the difference in cost between gas at 12 candles and gas of 18 candles is all that is required to be ascertained.

To produce gas having an illuminating power of 18 candles, it will be necessary to use three parts of Wigan cannel coal and one part of ordinary Newcastle coal.

Cost of Coal, and Fuel to Carbonize the same. Dr.				*Amount received for Products.* Cr.			
Wigan cannel, three-fourths of a ton, at 27s.	£1	0	3	By Sale of 15 bushels of Wigan coke, at 5s. per chaldron	£0	2	1
Newcastle coal, one-fourth of a ton, at 16s.	0	4	0	Ditto 9 bushels of Newcastle coke, at 3d. per bushel	0	2	3
Fuel to carbonize the above, 12 bushels at 3d.	0	3	0	Ditto 12 gallons of tar, at 1½d. per gallon	0	1	3
				Ditto 4 bushels of breeze, at 2s. per 42 bushels	0	0	2¼
Cost of coal and fuel	£1	7	3	Ditto 10 gallons of liquor, at 1s. 6d. per 108 gallons	0	0	1½
Value of products	0	5	11				
Net cost of 1 ton of coal	£1	1	4	Value of products	£0	5	11

The quantity of gas that 1 ton of coal in the above proportions will make is 9875 feet; it therefore follows that

1000 cubic feet will cost	2s. 2d.
Cost of 12-candle gas	0 11¼
Being a difference of	1s. 2¾d.

per 1000 cubic feet as the extra cost of making 18-candle gas.

12-Candle Gas.

Estimate based on the experience of the year 1866 of the cost of making 1000 cubic feet of ordinary coal gas, having a minimum illuminating power of 12 sperm candles, the items including merely the cost of coal and fuel for carbonizing, the amount realized by the sale of coke, tar, breeze, and liquor being deducted.

All other expenses of wear and tear, management, rates, taxes, &c., being altogether omitted in this estimate, as the difference in cost between gas of 12 candles and gas of 18 candles is all that is required.

Cost of Coal, and Fuel to Carbonize the same. Dr.				*Amount received for Products.* Cr.			
Coal, 1 ton, at 16s.	£0	16	0	By sale of 36 bushels of coke, at 3d. per bushel	£0	9	0
Fuel to carbonize the same, 12 bushels at 3d.	0	3	0	Ditto 9 gallons of tar, at 1d. per gallon	0	0	9
				Ditto 4 bushels of breeze, at 2s. per 42 bushels	0	0	2¼
Cost of coal and fuel	£0	19	0	Ditto 10 gallons of liquor, at 1s. 6d. per 108 gallons	0	0	1½
Value of products	0	10	1				
	£0	8	11	Value of products	£0	10	1

The cost, therefore, of 1 ton of coal is 8s. 11d., and, as 1 ton will produce 9500 feet of gas, it follows that the cost per 1000 feet is 11¼d.

(Signed)
F. J. Evans, Engineer, Chartered Gas Company.
T. N. Kirkham, Engineer, Imperial Gas Company.
S. W. Pritchard, Engineer, Western Gas Company.
H. Brothers, Engineer, Equitable Gas Company.
William Innes, Engineer, Phœnix Gas Company.

The notion very commonly prevails among those who are ignorant of the manufacture of gas, that the degree of illuminating power depends altogether on the quantity produced from a given weight of coal, and it has been not unfrequently absurdly asserted that the gas companies dilute the gas with atmospheric air. Many of the erroneous opinions entertained respecting the illuminating power of gas depend on that fallacious notion. It is well known, however, that it is impossible, by any process of distillation, to obtain more than 14-candle gas from the best Newcastle coal; and it will be observed that the committee of gas engineers estimate that practically 75 per cent. of cannel is required to produce 18-candle gas. The necessity for the use of cannel not only involves an additional outlay on account of the greater cost of the material, but, as will be seen from the foregoing report, the quantity and value of the residual cannel coke are very considerably less; thus the cost of coal for the production of nearly the same quantity of gas—not reckoning the fuel, which is the same in both—amounts in the case of 18-candle gas to upwards of three times the cost of the coal for the production of 12-candle gas, the proportions being as 18s. 4d. to 4s. 11d. per ton. The effect of the combined operation of raising the standard of illuminating power of the gas and of reducing its maximum price is thus stated by the gas companies:—

The quantity of gas now *made* by the several metropolitan companies may be taken at 10,440 millions of cubic feet per annum.	
If the additional cost be reckoned only at 1s. 2d. per 1000 feet upon this quantity, it will be found to amount to the annual sum of	£609,000
The gas *sold* by the various metropolitan gas companies may be taken in round numbers at 9000 millions of cubic feet per annum. [The difference between the quantity made and the quantity sold is the loss unavoidably incident to the distribution of gas.]	
The proposed reduction of price from 4s. 6d. to 3s. 6d. would amount to no less than £450,000.	
The companies have already reduced the price since the passing of the "Metropolis Gas Act," on an average 6d. per 1000 cubic feet, and the public have thus been benefited to the extent of £225,000.	
The reduction of another 6d. per 1000 cubic feet would deprive the companies of a further annual sum of	225,000
The combined result of the additional expense of increasing the illuminating power and the reduction of the price from that now charged would therefore be an annual loss of no less than	£834,000
The total net profit of the metropolitan gas companies, as shown by the last parliamentary return, was	678,986
This sum deducted from the amount above stated, shows a deficit of	£155,014

The gas companies then proceed to show that the cannel coal-fields are of very limited extent, and that if the standard of illuminating power were raised to 18 candles, 900,000 tons of cannel would be required in London alone, while the present total annual yield of Lancashire cannel amounts to not more than 650,000, and that the additional demand would lead to an enormous increase of price. It is further stated that of the 190 gas Acts passed between 1856 and 1866 inclusive, only 17 require a higher standard of illuminating power than 14 candles, and that there are only three which fix the maximum price lower than 4s. per 1000 feet.

The gas companies, after having shown that the amendments of the Metropolis Gas Act proposed by the Metropolitan Board of Works would not only be ruinous to them, but would put a stop to the supply of gas in London altogether, next proceed to consider the proposal to purchase their undertakings at a fixed charge of 6 per cent. on the present ordinary paid-up capitals now in the receipt of 10 per cent. They point out, in the first place, that if such a precedent were established in dealing compulsorily with the property of the gas companies of London, the same rule would apply to the property of all other companies, railways as well as gas and water; and after exposing the injustice of such a proposition, attention is called to the remarkable fact that the Metropolitan Board of Works, while suggesting that a standard of 18 candles and a price of 3s. 6d. should be imposed on the companies; if the Board were to undertake the supply of gas they do not intend to be bound by such obligations, so that the consumers of gas would not be benefited by the change of management. The pecuniary result to the ratepayers, supposing the Metropolitan Board were bound

by the same obligations they wish to impose on the gas companies, is thus set forth :—

It may be well, however, to consider the pecuniary result to the Metropolitan Board of their becoming the purchasers of the gas undertakings upon the terms proposed, and furnishing 18-candle gas at 3s. 6d. per 1000 cubic feet.

It has been shown that to supply gas at that standard of illuminating power and price would entail the sacrifice of all profit, and an annual deficit of	£153,014
To this must be added, for the interest of 6 per cent. on a share capital of 6 millions sterling	360,000
Making a total annual loss of £513,014 to be raised by taxation on the ratepayers of the metropolis generally, in order that the Metropolitan Board may undertake the manufacture of gas and deprive the companies of four-tenths of their statutory profits	£513,014

The first memorandum of the gas companies, which contains an answer to the propositions of the Metropolitan Board of Works, is dated January 21st; and in a second memorandum, dated the 23rd, they reply to another request from the Board of Trade, that they would state the amendments in the present system to which they would accede, and the grounds on which such amendments are offered, if they differed from those proposed by the Metropolitan Board of Works. In that memorandum the gas companies express their willingness to accede to the reduction of the maximum price fixed by the Metropolis Gas Act from 4s. 6d. to 4s. per 1000 feet, and to an increased standard of illuminating power of 14 candles instead of 12, to be tested by Dr. Letheby's burner. The gas companies also propose that the purity of the gas should be determined by a Chemical Board, consisting of three eminent chemists, to be appointed by the Home Secretary or the President of the Board of Trade, who should also appoint a chief gas analyst to decide finally in cases of dispute; and they also accede to the appointment by the same authorities of a public auditor to examine the periodical accounts of the companies. In the statement of the grounds on which some of these amendments differ from those proposed by the Metropolitan Board, it is stated, as evidence that they are not in a position to make larger concessions as to the quality and price of gas, that three of the companies, at the present reduced price of gas, have been unable for the past half year to maintain their dividends out of their current profits. The companies also affirm that they are desirous of supplying the purest gas that can be made, and that they desire that the public should be thoroughly satisfied on that point, for which purpose they consider it would be much better that the quality should be determined by a thoroughly competent authority than by any fixed standard.

In the third memorandum the gas companies examine the conditions of gas supply in provincial towns, more especially in Manchester and Plymouth, on which places much stress has been laid by persons who have agitated for cheap gas in London, and who have "perseveringly misrepresented that the "price in London is quite exorbitant as compared with that in "the provinces." A table is given of the prices of gas in Manchester from 1829 to 1836, for the purpose of showing that one of the principal causes of the present low prices in that town has been the payment of the mortgage-debt out of profits derived from time to time when the charge for gas was much higher. In 1844, when the gas-works passed from the Police Commissioners to the Corporation, the price per 1000 feet of gas was 6s.; in 1848 it was reduced to 5s., at which it continued until 1860; and since that period it has been reduced gradually to the present low prices of 3s. 2d. within the township and 3s. 8d. beyond. It is observed also, as further accounting for the low rate of charge, that cannel is procurable in Manchester for less than the price of Newcastle coal in London, which, together with the cheapness of labour, has allowed gas to be manufactured at a comparatively small expense. It is shown, nevertheless, that to pay a dividend of 10 per cent. on the amount actually invested in the works, higher prices would be required than the present price in London. The gas companies observe, in this part of the case—"The "comparison of prices, therefore, assuming the Manchester "capital not to have been paid off, stands in favour of "the London companies. And if we compare the Man"chester outlay of £810,000 with the capital outlay of the "London companies, we shall see that, for every million "feet made, the Manchester capital is £690, whereas the Lon"don capital upon each million feet made is less than £620." The case of Plymouth is next considered, and the low price there charged is shown to be owing to nearly similar causes; the purchase-money for the works, which were bought below cost price, having been partly paid off out of profits at a time when gas was charged at much higher prices, and the standard of illuminating power in that town being only 10 candles. The causes of the low prices in various other towns are stated to be capable of similar explanation, as being differently circumstanced from London, as would have been proved before the parliamentary committee of last session had the witnesses for the gas companies been heard. In support of this part of their case the gas companies adduce the parliamentary return relative to the gas supply of the United Kingdom, on which we have previously commented, and in like manner point out that the price charged when supplied by corporations is generally higher than when the supply is in the hands of companies. In the concluding remarks of the memorandum on this branch of the subject, the gas companies observe—"From the "foregoing facts, it is clear that if the price and quality of the "gas supplied in London were to be regulated by the price "and quality of the gas supplied in the provincial towns, "instead of by the circumstances specially affecting the metro"polis, the opponents of the companies would have no claim "to be supplied on more favourable terms than at present; "but, on the contrary, the companies would have a right to "raise their prices." As a further elucidation of the statement of the gas companies relative to the prices charged in Manchester, we insert (on p. 71) an analysis of the accounts of the Manchester Corporation Gas-Works since 1844. We wish particularly to direct attention to those columns of the accounts which exhibit the profits realized on the mortgage-debt and on invested capital. It will be seen that in 1845, when the gas was charged 6s. per 1000 feet, the Corporation were making a profit of 64½ per cent. on their mortgage-debt, which was, in fact, all the capital they had to pay interest upon, the other portion having been paid out of accumulated profits.

With the statements of the gas companies we have also before us the reply of the Metropolitan Board of Works to the request of the Board of Trade to be supplied with the data on which they founded the recommendation of a maximum price of 3s. 6d. per 1000 feet, and an illuminating power of 18 candles. The Board of Works make a great many preparatory grimaces before attempting to answer the question put to them, as if they would fain avoid being brought to book. They venture on various assumptions as to the object of the Legislature in sanctioning the districting arrangements and 10 per cent. dividends, one of which assumptions is, that in authorizing that amount of dividend it was not supposed it would ever be attained; but having been realized, contrary to the expectation of Parliament, it is fitting that it should be reduced. It is observed—and we agree that there is some truth in the remark—that when the maximum dividend is attained the companies have no further interest in the application of improvements by which the cost of production might be diminished. But the proper way of meeting that objection is the adoption of a sliding-scale of prices, as was done in the Sheffield Gas Act of last session, and in the previous Nottingham Act, according to which the prescribed amounts of dividend are increased as the price of gas is reduced; and in the Bill to be promoted by the Chartered Company next session the same principle is adopted. But the remarks of the Board of Works on this point are no answer to the question why the illuminating power of the gas should be raised to 18 candles, and the price reduced to 3s. 6d. per 1000 feet. In their next attempt to evade the question they assume that when a maximum dividend of 10 per cent. was prescribed, with power to make up back dividends to the same amount, Parliament did not intend to guarantee that amount of dividend; and, as no special guarantee was given, the Board conceive they have a right to deal with the property of the gas companies at their pleasure. After these evasions of the question, the Board at last venture to hint at some data whereon they founded their resolutions, and they amount to this—that an ex-manager of the Manchester Gas-Works was of opinion that cannel gas might be supplied in London for 3s. per 1000 feet; and that, according to Dr. Letheby's evidence, 14-candle gas has been supplied by one of the metropolitan companies for 4s.; "therefore the Board *felt there was no impropriety* in asking "the Legislature to fix a price of 3s. 6d. per 1000 feet for "18-candle gas." It is admitted that the present dividends cannot be maintained on those conditions, but the Board think they have a right to call on the gas companies to make increased exertions, and, by so doing, they believe the present dividends may be "approached." That is the sum and sub-

stance of the data which the Metropolitan Board of Works have furnished as the grounds of their resolutions. They recommend the Government to pass a measure of confiscation, because they have some reason to believe that, by increased exertions, the gas companies might save themselves from ruin. It is no wonder that they endeavoured to hide, by many introductory grimaces, the shame they must have felt at being obliged to render such a pitiful reason for their resolutions, and the chairman of the Board must have blushed on signing his name to the document. The Board, in venturing to speculate on the intentions of the Legislature as to guarantees for the future, forget to notice the fact that, until dividends of 10 per cent. are obtained, the companies are actually guaranteed by the Metropolis Gas Act a price of 4s. 6d., with a minimum illuminating standard of 12 candles. If, with that price and quality, they could divide out of profits 10 per cent. on their share capital, that per centage of profit was in fact guaranteed by Parliament. Had the gas companies not fulfilled the obligations imposed on them, or had circumstances arisen which could not have been foreseen by the Legislature in 1860, some data might have existed for an amendment of the Act; but nothing of the kind is alleged, and the only reason assigned by the Metropolitan Board of Works why the Government should confiscate the property of the London gas companies is, that if they made greater exertions they would save themselves from being ruined!

We have, on several occasions, had to notice the ignorant vituperation of the metropolitan gas companies by some portions of the public press, which, adopting the misrepresentations of the agitators for cheap gas, have denounced the illuminating power and the purity of that supplied in London, and have entered in full cry against the misdeeds of the "monopolists." It is satisfactory to find that a better tone is beginning to prevail, and that some at least of the newspapers view the subject with less prejudice, and with more desire to do justice to the maligned gas companies. The *Daily News*, of Friday last, contains an article on "London "Gas," which treats the question of purity in a fair spirit, and, considering the quality to be the most important part of the subject of gas supply, recommends that "no attempt at "change should be countenanced which is not preceded or "accompanied by scientific and practical information, which "shall be both-sided, impartial, and complete." The proposition of the gas companies to submit the question of purity to a competent Chemical Board, the members of which should be appointed by the Government, is the best method of obtaining such practical information, and ought to be heartily acquiesced in by all who profess to be interested in securing a supply of gas as free from impurity as is practically possible. In our last number we quoted from the *Saturday Review* some excellent remarks on the proposition of the Metropolitan Board of Works to confiscate the property of the London gas companies; and the *Morning Post* also in some recent articles has considered the question of the gas supply with commendable impartiality. It may be hoped, therefore, that the public will, in the course of time, be disabused of the prejudices against the gas companies, which have been so industriously excited by their opponents.

The engineer of the Metropolitan Board of Works invited the engineers of the London gas companies to a conference on the 24th ult., on the subject of laying gas-mains in subways. As the conference was private we are unable to report what took place, but we believe the opinions of the great majority of the engineers as to the danger of such a course remain unaltered. The difficulty of ventilating a subway so effectually as to prevent the light gas which may escape from lodging in arches or recesses, whence it would issue on the least fall of the barometer, and possibly form an explosive mixture with the air in the underground passages, prevents absolute security from being attained by any plan of ventilation hitherto proposed. At Nottingham, where a gas-pipe has been laid in a short subway, the workmen of the company are so apprehensive of danger that they refuse to enter it unless the gas is turned off, and time has been allowed for the subway to be thoroughly ventilated.

An application has been made to the Court of Exchequer for another trial of the case of the fire at Saville House, on the grounds that the defendants, the Chartered Gas Company, had on the last trial been taken by surprise; secondly, that the verdict was against the evidence; and thirdly, on the ground that there were affidavits to rebut the evidence which the defendants were not prepared to meet at the trial. As the late Chief Baron, before whom the action was first tried, and the present one differed entirely in their opinions as to the responsibility of the gas company and the insurance office, it is of great importance that the question should be definitely settled, and there are seventeen or eighteen claims depending on the issue, to the amount of between £70,000 and £80,000. After two days hearing, the decision of the court on the application was postponed for further consideration of the affidavits, it being suggested that the motion should stand over until one of the other pending actions has been tried. In the course of the arguments, Mr. Hawkins, the counsel for the gas company, made a spirited resistance to the doctrine laid down by Baron Martin, that when the judge before whom a case is tried is satisfied that the verdict is not against the evidence, no application for a new trial can be granted on that ground. It is seldom, of late years, that so stout a resistance is offered by counsel to judge-made law. Mr. Hawkins protested against it with manly independence, observing that if the judge's opinion is to be conclusive, a jury might be dispensed with altogether. It was admitted by the other judges that though the rule as declared by Baron Martin is not a matter of law, it is a matter of practice in the courts.

The cause of the flooding of the mains of the Chartered Gas Company, in the City, to which we alluded in our last, has not been discovered. It is conjectured that a water service-pipe which had been damaged by the frost was ignorantly connected, by the workman employed to repair it, with a gas service-pipe, and that the contents of a water-cistern were thus discharged into the gas-mains. When the mistake was discovered, it would probably be rectified by the offender without making any disclosure of what he had done.

The severe frost of last month somewhat affected the action of the meters attached to street-lamps, and had a most damaging effect on the double-tap in the places where that plan of regulation for street-lamps has been adopted. At Reading the registration by the meters and double-taps proved a complete failure, and the average meter indication could not be relied on in the least. In some other towns we understand that it was found necessary to cover with felt the few double-taps employed. The self-acting pressure-regulators, on the contrary, have withstood the test of the frost, and no complaints have been made of irregularity in the places where they were employed.

The conviction of the Newcastle Gas Company for supplying gas containing more than the tolerated quantity of 15 grains of sulphur in 100 cubic feet, merits the serious consideration of all gas companies, especially of those who are bound by similar obligations. The proceedings of the magistrates were, however, in many respects irregular, and we feel persuaded that the conviction cannot be sustained on appeal to a superior court. It is the general practice to interpret all penal enactments strictly, and it was contended by the solicitor for the company, confirmed by the opinion of Mr. Hawksley, that the whole quantity mentioned in the Act, of 100 cubic feet of gas, should be subjected to analysis before a legal conviction for default of purity. Such an interpretation would, indeed, render the imposition of penalties in most gas Acts altogether nugatory, for the process of analyzing 100 cubic feet of gas would occupy 150 or 200 hours, or about six or eight successive days, during which time many changes might take place in the quality of the gas, and the result would, after all, be only the determination of an average quantity. This appears, nevertheless, to be the strictly legal interpretation of the Act, and it would most probably be sustained by the judges. A similar technical objection might also be raised against a conviction for supplying gas of an illuminating power below the prescribed standard, as it might be urged that the gas should be tested in comparison with the whole number of candles, and that the exact weights each consumed should be ascertained. The questions which have thus been mooted show the inefficiency and the unsatisfactory state of the method at present adopted for maintaining fixed standards of purity and illuminating power by penal enactments, and may lead to the introduction of an improved system in the gas Acts of the ensuing session. Among the irregularities of the proceedings in the Newcastle Police Court, it may be noticed that members of the Corporation, at whose instance the summons against the gas company was issued, adjudicated on the case. They were at the same time prosecutors and judges, and, though they might have been thoroughly impartial in their decision,

some of them exhibited a stronger *animus* against the gas company, and more impatience to have done with the matter, than seemed consistent with the due administration of justice. Under similar circumstances an alderman of the City of London declined to act, on the ground that he was one of the Sewers Commissioners, who were prosecutors in the case.

It is satisfactory to find that our previous notice of the conviction of the Newcastle Gas Company has produced the denials inserted in another column, from several quarters, of the current report that a fraud had been practised on Dr. Letheby when he tested the gas of the company, and found it to contain only 4·93 grains of sulphur in 100 cubic feet.

MANCHESTER GAS.

Analysis of the Accounts of the Manchester Gas-Works since 1844, *when the Works were transferred from the Police Commissioners to the Corporation.*

Year.	Maximum Price of Gas per 1000 Feet within the City.	Gas Rental, including Lamps.	Amount of Mortgage Debts.	Capital Invested in Gas-Works.	Gross Profits of the Gas-Works.	Profits Realized per Cent. on the Mortgage Debt.	Profits Realized per Cent. on Invested Capital.	Application of Profits.					
								Interest.	Sinking-Fund Mortgage Debt.	Sinking-Fund Improvemnt Debt.	Depreciation-Fund.	Improvements.	Water-Works.
1844	Gs. 0d.	£ 62,601	£ 78,750	£202,014	£39,960	50·74	19·78	£ 3,244	£ 5,000	....	....	£30,083	....
1845	6 0	74,174	67,100	211,906	43,273	64·49	20·42	2,942	5,000	....	....	12,342	....
1846	6 0	80,159	98,850	235,786	45,434	45·96	19·27	3,335	5,000	....	....	42,036	....
1847	6 0	80,781	97,500	255,416	46,172	47·35	18·08	4,134	5,000	....	....	8,012	....
1848	5 0	70,148	97,750	271,862	32,900	33·65	12·10	3,972	5,000	....	....	28,179	....
1849	5 0	76,854	92,000	274,428	38,539	41·89	14·04	3,163	5,000	....	£ 2,500	29,294	....
1850	5 0	86,534	90,350	282,193	46,632	51·61	16·52	3,523	5,000	....	2,500	35,808	....
1851	5 0	95,107	97,600	301,995	54,665	56·00	18·10	6,858	5,000	£1,553	3,750	37,504	....
1852	5 0	100,707	118,750	314,049	56,008	47·16	17·83	7,261	5,000	3,144	5,000	17,801	£17,801
1853	5 0	107,865	123,000	349,720	56,962	46·31	16·28	7,972	5,000	3,131	5,000	17,930	17,930
1854	5 0	116,793	133,450	401,029	57,288	42·92	14·28	8,216	5,000	3,132	5,000	17,970	17,970
1855	5 0	117,012	195,925	439,403	57,393	29·29	13·06	9,765	5,000	3,132	5,000	17,473	17,473
1856	5 0	122,839	217,675	461,209	61,842	28·41	13·40	11,369	5,000	3,132	5,000	18,670	18,670
1857	5 0	127,131	222,775	333,349	66,527	29·86	19·96	12,405	5,000	2,350	5,000	20,886	20,886
1858	5 0	129,359	294,053	366,445	55,293	18·80	15·08	13,930	5,000	2,350	5,000	14,507	14,507
1859	5 0	141,462	300,570	386,986	60,718	20·20	15·68	15,330	7,500	2,350	5,000	....	....
1860	5 0 / 4 6	154,658	355,175	412,627	71,137	20·03	17·24	16,254	13,306	....	5,000	17,609	17,609
1861	4 6 / 4 0	152,323	355,403	436,209	63,196	17·78	14·48	16,098	18,980	....	11,372	8,373	8,373
1862	4 0	143,310	349,848	449,886	54,846	15·67	12·19	15,482	19,330	....	12,179	7,854	....
1863	4 0 / 3 9	147,422	344,173	450,400	68,471	19·89	15·20	14,932	18,609	....	12,666	22,261	....
1864	3 9 / 3 6	157,130	319,133	460,747	72,236	22·63	15·68	13,888	17,810	....	12,690	27,847	....
1865	3 6 / 3 2	159,698	295,573	481,065	69,482	23·50	14·44	13,086	17,587	....	13,050	25,758	....
1866	3 2	168,790	328,414	502,699	66,370	20·21	13·20	13,252	19,784	....	13,817	19,516	....
								220,411	208,006	24,274	129,624	477,713	151,219

Correspondence.

NEWCASTLE GAS.

Sir,—In the "Circular to Gas Companies" in the last number of your Journal, you allude to the rumours current respecting a cleverly contrived fraud practised on Dr. Letheby, when he tested the Gas at Newcastle-on-Tyne for sulphur, and reported that it contained only 4·93 grains in 100 cubic feet. That these rumours are without the slightest foundation in truth I have not any doubt whatever; for, irrespective of the high character of the persons most interested in such fraud, which to me is sufficient proof of the falseness of the rumours, I happen to have independent corroborative evidence of the great freedom from sulphur of the Newcastle-on-Tyne gas about the time when Dr. Letheby made his test, and when the same kind of coals (Towneley) were being used at these works. In January, 1863, I made five distinct examinations of the gas on behalf of the Newcastle-on-Tyne Town Council, and found the following results per 100 cubic feet of gas:—

Jan. 17, 1863	.....	8·35	grains of sulphur.
„ 20, „	.....	10·71	„
„ 22, „	.....	11·19	„
„ 23, „	.....	10·23	„
„ 24, „	.....	11·16	„
Average	.....	10·33	grains.

These examinations, the results of which substantially confirm Dr. Letheby's, were made in my own laboratory, with the apparatus devised by Mr. A. Wright, in which the gas is burnt from a single jet at the rate of half a foot per hour, in an atmosphere containing ammonia, the products of combustion being passed through a Liebig's condenser.

When I made the test on the 20th of December last, showing 20·71 grains of sulphur per 100 cubic feet of gas, only a very small proportion of Towneley coal was being used at the gas-works.

John Pattinson.

Laboratory and Assay Office,
31, *Side, Newcastle-on-Tyne, Jan.* 31, 1867.

Sir,—I was surprised, in reading your Journal of the 22nd inst., to find you giving currency to "certain rumours respecting a cleverly contrived fraud practised on Dr. Letheby, when he tested the gas for sulphur in Newcastle-upon-Tyne, in 1863, when he reported it contained only 4·93 grains in 100 cubic feet—an unexampled degree of purity, attributed at the time to the excellence of the Towneley coal, but which," you add, "further experience has not confirmed."

Any imputation of fraud must necessarily affect me, as I was then the manager of the Newcastle Gas-Works; and, in justice to myself and the company, I think it would have been as well had you obtained evidence as to their authenticity first, before the statement was published, as there is no truth in them whatever, and they are entirely without foundation.

Allow me, then, to say, that when Dr. Letheby came to Newcastle in 1863, he brought his own apparatus with him, and tested the gas at the office of the company in the town (and not at the works) from the service-main in the street that supplies the offices with gas; and the gas then and there supplied to Dr. Letheby was actually the same as that supplied to the consumers in the town.

Dr. Letheby's report of the gas tested then was about 5 grains in every 100 cubic feet of gas.

Messrs. Richardson and Marecco, analytical chemists, tested the gas at their laboratory about the same time, and found it to contain less sulphur than what Dr. Letheby stated in his report.

Mr. Pattinson, analytical chemist, tested the gas at his laboratory about the same time, and found it to contain about 8 grains in every 100 cubic feet of gas.

Also M. Ellissen, of the Paris Gas Company, tested the gas some time afterwards for his report, and found the result to be about the same as Mr. Pattinson's.

The above results were obtained from the gas made from Towneley Main coal, and I did not find any difficulty in purifying it so as to keep within the strict requirements of the Newcastle Gas Act.

John Arnott,
Late Manager of the Newcastle Gas Company.

Leeds, Jan. 31, 1867.

Sir,—In your Journal of the 22nd inst. the following appears:—"The Newcastle-upon-Tyne Gas Company have been again convicted of supplying gas containing more than the tolerated quantity of 15 grains of sulphur in 100 cubic feet. We have hitherto refrained from alluding to the rumours current respecting a cleverly contrived fraud practised on Dr. Letheby when he tested the gas for sulphur, and reported that it contained only 4·93 grains in 100 cubic feet—an unexampled degree of purity, attributed at the time to the excellence of the Towneley Main coal, but which further experience has not confirmed."

The natural inference to be drawn from the above is, that the Newcastle Gas Company use no other than Towneley coals. Allow me, as one of the principal owners of the Towneley Collieries, to say that such is not the case; the fact being, that in the month of December only about one-fifth of the quantity used by them was obtained from us, and in the five days immediately preceding that on which the tests were made, and the excess of

sulphur found alluded to in the above paragraph, we only supplied 63 tons, or an average of a little more than 12 tons per day, their daily consumption of other coals at that time being about 250 tons per day.

In 1863, when Dr. Letheby found the gas to contain only 4·93 grains of sulphur, the company were using Towneley coal exclusively, and experiments made at that time by a firm of eminent analytical chemists, gave the quantity of sulphur less than Dr. Letheby found it. Mr. John Pattinson, the eminent analytical chemist of this town, and the analyst appointed by the corporation under the Newcastle Gas Company's Act, in a series of experiments made by him in January, 1863, found the average to be 10·33 grains. No fraud could be practised on any of these gentlemen, as their tests were made in their own laboratories from the gas supplied to the town.

Towneley coal has always been celebrated for the small quantity of sulphur it contains, a fact proved by long practical use, and also from analyses made by several analysts, some of whose reports I enclose. Now the article in your paper is calculated to injure the character of our coal, and therefore, in justice to myself and partners, I trust you will insert this letter in your next number.

Towneley Coal Offices, ADDISON POTTER.
Newcastle-upon-Tyne, Jan. 31, 1867.

HEATING BATHS BY GAS.

SIR,—I shall be much obliged by any of your readers giving me advice under the following circumstances:—

I have a Flavel's Kitchener, with boiler at the back, which was intended to heat a bath 30 feet off, and 15 feet higher. The pipes are well bedded in sawdust, but it does not do its work, and I believe the reason to be that the boiler is too large, and the hot water is below instead of above.

I called in two conjurors, friends of mine, to advise upon and fix a gas-stove, close to the bath cistern, in aid of the kitchen fire. The stove has been in action a year nearly, and answers the purpose, and it consists of a cylindrical boiler 1 foot in diameter and 18 inches high, with the cold water conducted to the bottom, and the hot issuing from the top, in the usual way; there is a ring notched for some fifteen gas-jets, 3 inches below the boiler, and the boiler and ring are enclosed in a copper jacket, with a space between all round, and door and holes to let in air; a 2-inch chimney goes from the jacket through the roof of the bath-room to the open air.

But although it heats the cistern above the bath, it is a sore nuisance, for immediately it is lighted the whole house, top and bottom, stinks of half-consumed gas, and there is a considerable accumulation of caked soot at the bottom of the jacket, fallen off from the bottom of the boiler.

My question then is—how can I heat my cistern by gas without an unpleasant smell? and not being myself an engineer, and having no science, I can only guess as follows:—

1st. As regards the kitchen boiler, if it were 1-10th of its cubic dimensions, and the same area of surface as at present exposed to the fire, no gas would be wanted.

2nd. As regards the gas boiler, if, instead of a circle of 1 foot surface at bottom, that surface were doubled or tripled, made of the thinnest copper, formed into a crescent, to concentrate the heat, but not enclosed in a jacket, and not heated by a ring of small jets, but by a single united flame, at the distance, say, of a foot from the bottom of the boiler, but conducted to it by a tin tube, similar to the ordinary glasses, there would be more heat, the gas would be perfectly burned, and no smell would ensue.

The boiler itself should be reduced to one-third of its present capacity, that is, to hold about one gallon instead of three.

The above are probably crude notions of an ignorant person. I, however, take the principle from the common camp or pic-nic kettle, which, being very shallow, is speedily heated by a very small quantity of fuel.

Is it necessary to have two pipes for safety against the hydrostatic pressure on the boiler, and at about what distance (of fall) may it be dispensed with? BOS PIGER.

Register of New Patents.

1539.—ANDREW BETTS BROWN, of 13, Cannon Street, in the City of London, for "*Improvements in engines for pumping water, applicable to engines for feeding steam-boilers.*" Patent dated June 2, 1866.

In performing this invention a steam-cylinder is employed, containing a piston, with a piston-rod of large diameter on one side of it, and terminating in the ram of the pump. The steam is admitted to the further side of the piston by means of a slide-valve, working in a casing beyond the end of the cylinder, the valve-face being on a plane at right angles to the direction of motion of the piston. The valve has horns formed on it, between which a crank-pin or small eccentric is lodged, and the said pin or eccentric is carried by a light shaft passing out of the valve-case through a stuffing-box and journal, and having a small fly-wheel upon it, which takes its motion by means of a connecting-rod passing from a crank-pin in the face of the wheel to an arm which projects from the piston-rod or ram between the steam-cylinder and the barrel of the pump; or the arm may be made together or in one piece. Double-acting pumps may be worked in a similar manner, the areas of the two sides of the steam-cylinder being, in this case, made more nearly equal.

1541.—EDWARD PRIMEROSE HOWARD VAUGHAN, of 54, Chancery Lane, in the co. of Middlesex, patent agent, for "*Improvements in the construction of reflectors.*" A communication. Provisional protection only obtained. Dated June, 2, 1866.

This invention consists in the employment of mica instead of glass in the construction of reflectors either coated with a metallic surface, as glass is, or as a covering for reflectors already made.

1552.—DESIRÉ ALFRED DUMUIS, sanitary engineer, ELMIR JEAN FRANÇOIS FLICOTEAUX, sanitary engineer, EDWARD WILLIAM NIBLETT, mechanical engineer, and MANUEL LEOPOLD JONAS LAVATER, manufacturer, all of 29, Boulevart St. Martin, Paris, for "*Improvements in water-closets, urinals, lavatories, and other receivers, and also in taps for supplying liquids to the same.*" Patent dated June 5, 1866.

The details of this invention require to be illustrated with drawings to render them intelligible.

1568.—JOHN CARRINGTON SELLARS, of Birkenhead, in the co. of Chester, manufacturing chemist, for "*Improvements in treating coal, cannel, shale, or their compounds, or the residuum thereof from calcination or distillation, and in manufacturing plastic substances and forms, cements, pigments, colouring matter, and manure therewith.*" Provisional protectiononly obtained. Dated June 7, 1866.

The improvements consist in treating the residuum from the distillation of coal, cannel, shale, and other compounds where the material is used as a source of oil or gas, or from combustion when used as fuel, for the production of a red-brown substance or powder by further heating or burning the said coke or residuum in the open air alone, or assisted by water, steam, or vapour to quicken the oxidation of the iron therein contained, particularly refuse coke made in revolving retorts, by calcining in suitable iron or baked earthenware vessels.

The substance or powder thus produced is a source of iron or metallic oxide paint, pigment, or colouring matter, and may be used as a material for making tiles or bricks, or other plastic forms, as a cement for steam or oil joints, as a body for reducing expensive chemicals, as a substitute for any substance now in use which is required in a fine state of division or minute condition, such as whitening medium for moulding or for polishing metals.

1584.—JENKIN JONES INGRAM and GEORGE RICHARD PHILLIPS, both of the Stuckton Iron-Works, Fordingbridge, in the co. of Hants, engineers, for "*Improvements in valves for regulating feed suction and other purposes.*" Provisional protection only obtained. Dated June 9, 1866.

This invention relates especially to valves for the feed-pumps of steam-engines, but it is also applicable to other purposes in which regulating valves or cocks are used. It consists in the use of a valve composed of a disc of india-rubber, leather, or other suitable elastic material, fixed in the centre to a seat formed in the aperture leading from the suction-pipe. The seat for the valve is or may be formed by a bar across the aperture, with a boss in the centre of the bar to receive the screw-stud or pin by means of which the disc is to be fixed to the seat. The disc, when fixed in the seat, has its upper part or edge resting on a part of the valve-box, in which the passages for water or other fluid are cast or otherwise formed. The guard or stop is a kind of inverted cap, fixed on the end of a vertical screw, inserted in the top of the valve-box, and working through a stuffing-box therein. When this inverted cap is worked downwards by the screw, its upper part or edge is or may be brought into contact with the upper part or edge of the valve disc, or the same effect will be produced by the rising of that part of the disc which is pressed upwards by the water or other fluid on its passage from the suction-pipe. By means of the moveable guard or stop thus referred to the extent to which the disc is allowed to rise, and the consequent action of the valve, may be regulated as required, or the disc may be kept down and the valve closed. There are apertures in the inverted cap to allow the water to press on all parts of the disc or valve at the return stroke of the plunger of the pump, and at the same time to prevent undue pressure on the upper surface of the inverted cap or stop. In some cases the valve may be used without a guard or stop. The valve may be readily repaired by removing a worn out disc from the seat and fixing a new one thereto.

1593.—SAMUEL LEES, of Salford, in the co. of Lancaster, manufacturing chemist, for "*Improvements in furnaces for consuming petroleum and other hydrocarbons.*" Patent dated June 12, 1866.

This invention consists in constructing the furnace of a metal trough, filled with metal or other balls, some of which are solid and others hollow and perforated. This trough occupies the space in the furnace usually taken up by the grate-bars, and air is supplied to support the combustion through perforations in or near the door of the furnace. A baffle-plate is placed near the door and above the trough to guide the air into the trough.

The petroleum or other hydrocarbon to be consumed is supplied by a pipe from a cistern to the front end of the trough. In this pipe is a tap to regulate the supply. Before starting the furnace all the balls are taken out of the trough; the hydrocarbon is then allowed to run into the trough, and the small solid balls forming the first layer of balls, after being heated, are placed in the trough. The hydrocarbon is thus ignited, and then the hollow perforated balls are placed in the trough. These latter may be put in cold. It is preferred to employ balls of different diameters for each layer, having the largest at the top. The heat from the burning hydrocarbon gradually heats the balls till they are red, and the gases evolved mixing with the air supplied through the perforations in or near the door and that contained in the hollow balls are entirely consumed as they pass to the flues of the boiler or other vessel to be heated. This improved furnace may also be used for any purposes where ordinary furnaces are now employed, and by connecting the tap in the supply-pipe to a mercury or other gauge the supply of hydrocarbon can be regulated according to the temperature required.

1594.—Thomas Joseph Leigh, of 7, Lansdowne Cottages, Denmark Street, Camberwell, in the co. of Surrey, civil engineer, for "*Improvements in the method of burning coals (whether large or small coals), coal dust, coke, coke dust, charcoal, wood, and other combustible substances, as also hydrocarbons and gases, and in the arrangement of the furnaces applicable thereto.*" Patent dated June 12, 1866.

This invention consists in burning coals, whether large or small coals, coal dust, coke, coke dust, wood, and other combustible substances, as also hydrocarbons and gases, on or in a stratum, bed, or bath of molten iron or metal through which atmospheric air, or oxygen, or atmospheric air and steam, or any vapour which evolves oxygen, is forced. In order to do this a chamber or generator is employed, which may be made of iron or other metal, lined with fire-bricks, or other refractory substance, which chamber or generator is closed in or arched over with a dome, or other means to prevent the escape of the flames or loss of heat, except in the direction required, where an aperture is provided, the lower edge of which corresponds to, or is analogous to the bridge in ordinary furnaces.

APPLICATIONS FOR LETTERS PATENT.

145.—Alfred Upward, of the Chartered Gas Company, 146, Goswell Road, in the co. of Middlesex, civil engineer, for "*Improvements in apparatus used for boring and tapping gas and water mains, and in fitting service-pipes or cocks thereto.*" Jan. 19, 1867.

164.—John Patison, of Ardrie, in the co. of Lanark, N.B., manufacturing chemist, for "*Improvements in the production of illuminating gas, and in the manufacture and application or use of new or improved materials or fuels for the same, and in the means or apparatus employed therefor.*" Jan. 22, 1867.

190.—John Lacey Davies, of the firm of John Davies and Son, of 4, St. Ann's Square, Manchester, in the co. of Lancaster, patent agents, for "*Certain improvements in lamps to be employed for the purpose of illumination.*" A communication. Jan. 25, 1867.

211.—John James Lundy, of Leith, in the co. of Mid Lothian, N.B., colour, grease, and chemical manufacturer, for "*Improvements in the treatment of the residual matters resulting from and obtained in the purification and distillation of mineral or hydrocarbon oils, and also in the treatment of coal tar and various waste or other alkaline and lime substances for the purpose of utilizing the same.*" Jan. 26, 1867.

214.—Elisabeth Lichtenstadt, of Bermondsey New Road, in the co. of Surrey, for "*Improvements in portable or other water-closets.*" A communication. Jan. 26, 1867.

227.—William Henry Stallard, of Mera Lodge, Bexley Heath, in the co. of Kent, for "*Improvements in admitting and regulating atmospheric air or vapour to gas-burners.*" Jan. 28, 1867.

230.—François Constant Cambrelin, of Brussels, in the kingdom of Belgium, engineer, for "*Improvements in lighting railway carriages with gas, and in the apparatus employed therein.*" Jan. 29, 1867.

231.—James Greenshields, of Glasgow, in the co. of Lanark, N.B., for "*An improved compound or combination of materials to be used for the production of illuminating gas.*" Jan. 29, 1867.

252.—Henry Richardson Fanshawe, of Mill House, Tottenham Hall, Tottenham, in the co. of Middlesex, for "*Improvements in the lighting of mines, sewers, and other similar subterraneous places in which inflammable and explosive gases may form and collect, and in the lamps or lanterns and other apparatus to be used therewith.*" Jan. 30, 1867.

255.—Bristow Hunt, of 1, Serle Street, Lincoln's Inn, in the co. of Middlesex, gentleman, for "*Improvements in gas-regulators.*" A communication. Jan. 30, 1867.

GRANTS OF PROVISIONAL PROTECTION.

2847.—Josiah Harris, of 41, Threadneedle Street, in the City of London, for "*Improvements in apparatus for the production, distillation, and refining of hydrocarbon and other oils from shale, cannel, coal, peat, lignite, or other bituminous minerals.*" Nov. 3, 1866.

3147.—Tony Petitjean, of 4, Brydges Street, Covent Garden, in the co. of Middlesex, chemist, for "*A new means for procuring the more perfect combustion in the burning of fuel.*" Nov. 30, 1866.

NOTICES TO PROCEED.

2380.—Peter Brash, of Leith, in the co. of Mid Lothian, N.B., soap, candle, and oil manufacturer, and William Young, manager of the Oil-Works, Straiton, in the same co., for "*Improvements in the manufacture of oil from shale and other bituminous substances.*" Sept 17, 1866.

2395.—Thomas Parkes, of Birmingham, in the co. of Warwick, manufacturer, for "*Improvements in tube-cutters.*" Sept. 18, 1866.

2396.—Henry Justinian Newcombe, of 49, King William Street, in the City of London, for "*Improved apparatus for heating or warming buildings.*" Sept. 18, 1866.

2434.—John Mortimer Heppel, of 2, Storey's Gate, Westminster, for "*Improvements in fluid-meters, also applicable to pumps and water-pressure engines.*" Sept. 21, 1866.

2483.—Henri Adrien Bonneville, of 24, Rue du Mont Thabor, in the empire of France, and 38, Porchester Terrace, Bayswater, in the co. of Middlesex, patent agent, for "*Improvements in machinery for raising water.*" A communication. Sept. 26, 1866.

3106.—William Edward Newton, of 66, Chancery Lane, in the co. of Middlesex, civil engineer, for "*An improved process for extracting oil and paraffin from bituminous substances, such as peat or coal.*" Nov. 26, 1866.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

3096.—Michael Henry, "*Improvements in apparatus for regulating the passage of aëriform and other fluids.*" Dec. 8, 1863.

3200.—John Macarthy. "*Improvements in taps, cocks, or faucets.*" Dec. 19, 1863.

3213.—William Henry Tooth, "*Improvements in the manufacture of iron and steel, and in the machinery, apparatus, and furnaces used therein, and for the production and application of gas to be employed in such manufacture, and the application of parts of the said apparatus to the manufacture of glass and alkali.*" Dec. 19, 1863.

3220.—Edward Wilson and George Lindsley, "*An improved method of feeding locomotive and other boilers, applicable also to the raising of water and other liquids.*" Dec. 21, 1863.

3289.—Nathaniel Fortescue Taylor, "*Improvements in means or apparatus employed in increasing the illuminating power of coal gas.*" Dec. 29, 1863.

33.—Joshua Kidd, "*Improvements in supplying and regulating any required liquid used in the process of generating gas or steam, or for the carburetting of gas, for supplying and regulating the water to gas-meters, an oil for lubrication, and in apparatus connected therewith.*" Jan. 5, 1864.

59.—William Brookes, "*Improvements in steam-engines, which improvements are also applicable to engines actuated by air or gas as a motive power.*" Jan. 9, 1864.

109.—John Edward Baker, "*Improvements in retorts and furnaces for distilling coal and peat and other solid hydrocarbons, for the manufacture of volatile oils therefrom, which improvements may also be applied to retorts and furnaces used for other purposes.*" Jan. 15, 1864.

121.—William Charles Rogers, "*Improvements in gas-lamps.*" Jan. 16, 1864.

136.—Robert William Sievier, "*Improvements in cocks or taps.*" Jan. 18, 1864.

163.—Edgar Townend Jarrold and George John Yates, "*Improvements in deodorizing paraffin, petroleum, rock shale, and other hydrocarbon oils.*" Jan. 21, 1864.

173.—Charles Todd Woodman, "*A new and useful improvement in closing bottles, jars, faucets, and stop-cocks.*" Jan. 22, 1864.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £100 BEFORE THE EXPIRATION OF THE SEVENTH YEAR.

2717.—Charles Antoine Fournier, "*A process and apparatuses intended to find out the escapes of lighting gas from the conveying-pipes, and to determine the precise leaking-places of the said pipes.*" Dec. 1, 1859.

2723.—John Paton, "*Improvements in valves.*" Dec. 1, 1859.

2745.—Edwin Augustus Curley, "*Improved mechanical arrangement or contrivances for measuring, registering, and regulating the flow of liquids, and likewise for measuring and regulating the passage of liquids and vapours.*" Dec. 3, 1859.

165.—Martin Rae, "*Improvements in roughening or obscuring glass globes, tubes, or other vessels.*" Jan. 23, 1860.

185.—Frederic Yates, "*Improved apparatus for generating certain gases to be used as fuel and as reducing agents in metallurgic and other operations, and improvements in furnaces to be heated and worked therewith.*" Jan. 25, 1860.

Legal Intelligence.

ROLLS CHAMBERS.

MONDAY, JAN. 28.

(*Before* Mr. Hawkins, *Chief Clerk.*)

Re London Gas-Meter Company, Limited.

This was a summons taken out by Colonel Dunbar Douglas Muter, to have his name removed from the list of contributories, on the ground that when he was induced to take his shares, he was told that the company was in a flourishing condition, whereas in truth it was insolvent at the time.

Mr. Ireland appeared for the liquidators—Mr. Lambert, a banker; Mr. Yates, the chief clerk of the Alliance Bank; and Mr. Bedford, the secretary, the three gentlemen appointed at a meeting where a voluntary winding up was agreed upon.

Mr. Greaves represented Colonel Muter.

The Chief Clerk: The fraud, if fraud, or the misrepresentation, if misrepresentation, was by particular members of the company, as Colonel Muter alleges.

Mr. Greaves: We say these shares were in the nature of forfeited shares, and as such were the property of the company, not able to be disposed of except by the company; and that, we contend, is a different case from an ordinary case of transfer.

The Chief Clerk: The representations which Colonel Muter says induced him to take the 35 shares, were made by particular members of the company, and not made by the board.

Mr. Greaves: But the transaction was not completed until after the misrepresentation.

He understood the board must be consulted before the transfer could be made to him.

Mr. Ireland: Mr. Bedford, who was the secretary from the 6th of June, 1865, to the time when the order for winding up was made, says, he attended every meeting of the board, and that he remembers Colonel Muter coming in June, 1865, and bringing the transfer to him, that he attested the deed, and that the call was paid. The transfer was actually executed by Colonel Muter, and delivered to Mr. Bedford, the secretary, prior to the colonel seeing the directors. Therefore, he could not have been guided by what the directors said.

Mr. Greaves: He says he was told by Mr. Bedford that it was necessary for those papers to be completed that they should be submitted to the board.

Mr. Ireland: There is one point I should mention, sir. I have not got an affidavit verifying the list of contributories.

The Chief Clerk: I do not want that. He admits he is put upon the list, by the fact of applying to be taken off.

Mr. Ireland: I have the books showing that he paid £315 on the 28th of June.

The Chief Clerk: I do not feel that at present I can take him off.

Mr. Greaves: What is your opinion as to the shares being in the nature of forfeited shares?

The Chief Clerk: Is it clear that all the shares were duly forfeited?

Mr. Ireland: I am told there was some arrangement made by which Colonel Muter was allowed to take the shares although they were forfeited.

The CHIEF CLERK: They appear to have avoided a forfeiture by permitting the person who incurred the forfeiture to sell.

Mr. GREAVES: The company was clearly not in the state it was represented to be at the time the transfer took place.

The CHIEF CLERK: Unless Ship's case decides this question, it is still *sub judice*; and the case of Overend, Gurney, and Co. not being decided, I should not like to take Colonel Muter off until the judgment is given.

Mr. IRELAND: The question in Overend, Gurney, and Co. was alleged misrepresentation in the prospectus. This is alleged misrepresentation by some of the directors.

The CHIEF CLERK: You do not file an affidavit by any of the directors, saying that the facts as stated by Colonel Muter are not accurate. I do not think the case is ripe to go into court, but it is a case of too much importance for Colonel Muter to leave to me.

Mr. IRELAND: We are paying a dividend of 10s. in the pound this morning, and a good many shareholders have not yet paid up; probably we shall have all we require. If you think I should get affidavits from the directors I will do so.

The CHIEF CLERK: I think it is due to Colonel Muter that you should file an affidavit upon that point.

Mr. IRELAND: Mr. Bedford, the secretary, says he never made any misrepresentation, and he is of opinion that if the company had had sufficient capital to carry on the business without borrowing money, it would have succeeded, and realized a good profit.

Mr. GREAVES: That is a very loose statement indeed.

The CHIEF CLERK: It is only matter of opinion. I think the matter had better stand over until Overend, Gurney, and Co. is decided.

VICE-CHANCELLOR'S COURT.

THURSDAY, JAN. 31.

(*Before Vice-Chancellor Sir* JOHN STUART.)

Re COLONIAL AND GENERAL GAS COMPANY, LIMITED.

This was a motion on behalf of Messrs. Servet and Orriols to discharge an order made by the Vice-Chancellor at chambers on the 21st of January, 1867, directing the acceptance of an offer of Messrs. Lishman and Co. to purchase the above company's gas-works and land at Murcia, in Spain, and the concession with respect to them, for £3000, and to confirm a contract made by the official liquidators of the above company on the 24th of December, 1866, for the sale to the present applicants, for the sum of £2000, of the company's gas-works and land at Murcia, and the concession granted with respect to the same, and to authorize the official liquidators to carry the same into effect. On the 9th of November, 1866, an order was made to wind up the company under the supervision of the court. On the 20th of December an offer was made by Messrs. Servet and Co., of Murcia, for the purchase of the company's works and land at Murcia, and the concession in regard to them, for £2000; £500 of which was to be paid in cash, and the remainder in three bills of £500, one on the official liquidator, payable at once, and the other two payable at four and eight months respectively. On the 22nd of December an offer was made by Messrs. Lishman and Co. for the purchase of the same works and land for the sum of £3000; £2500 of which was to be secured by debentures, and the remaining £500 by a bill at three months date from the time of sale. On the same day the chief clerk authorized the official liquidators to accept whichever of the two offers they deemed most beneficial to the company. On the 24th of December the solicitor to the liquidators demanded of Lishman and Co. that they should consent to bear his expenses in Spain, not exceeding £150; and on the same day the liquidators accepted the offer of £2000. On the 12th of January inst. an order was made in chambers authorizing Lishman and Co. to bring in a further offer, and they then offered £3000 in cash. On the 21st of January an order was made accepting such offer.

Mr. BACON and Mr. EDDIS supported the motion; Mr. GREENE and Mr. LOCOCK WEBB for Lishman and Co., and Mr. KARSLAKE and Mr. GRAHAM HASTINGS for the official liquidators, resisted it.

The VICE-CHANCELLOR said that it appeared that the liquidators had, on the 22nd of December, sufficient authority to enter into a contract with Messrs. Servet and Orriols, and that they had accordingly done so. As the court always desired that good faith should be kept with those who purchased under its orders, the contract with those gentlemen, although not the most advantageous to the company that could have been made, would be confirmed, and the order of the 21st of January would be discharged.

FRIDAY, FEB. 2.

(*Before* MR. HALL, *Chief Clerk.*)

Several matters connected with the liquidation of this company came before Mr. Hall, one of Vice-Chancellor Stuart's chief clerks, this day.

Mr. DAVIS, from the office of Mr. Howard, solicitor to the official liquidator, said the first summons on which he appeared was one which had been adjourned from the previous Monday, and its object was to obtain leave to continue the reference of all matters in dispute between the company and Mr. Edwin Maw to Mr. Hawksley. It would, perhaps, save time if he were to state the effect of the affidavit.

The CHIEF CLERK: What was the cause of the dispute?

Mr. DAVIS: This—Mr. Maw possessed, as he alleged, two concessions for lighting the town of Bastia and another town, both in Corsica. The concession for lighting the town of Bastia he was to have assigned to the company, and it was considered by the company that he had done so, but it turned out afterwards that he had no right to sell that concession at all, and that, in fact, instead of belonging to him the concession belonged to the Corsican and Mediterranean Gas Company. Amongst the points mentioned in the affidavit were these, that the concession was to be assigned for the sum of £20,000, and that if the municipal engineer required any works to be done from the date of the sale, transfer, and purchase, the contractor was to effect that at his own cost; the second article of the agreement provided that the works were to be put in perfect working order, and any expense necessary for so putting them in working order was to be deducted from the £20,000. Then another article specified the mode in which payment was to be made—so much in shares, and so much in cash, or, failing cash, in debentures; but that in no case should the directors be compellable to provide for payment beyond 20 per cent. of the said contract price. In the result the Colonial and General Gas Company had to give up the Bastia concession and works to the Corsican and Mediterranean Company, and to pay them £250 as liquidated damages. The Colonial Company contend they have a right to set off against Mr. Maw's claim of £4000 for goods supplied, which, according to Mr. Hawksley's certificate, they have to pay, everything which they have paid in respect of the Bastia concession, and also all moneys which they may be liable to pay in respect thereof. Then if it should be held by the arbitrator that we do not sustain our set-off, Mr. Maw then claims the option of payment; but we say that the directors, and now the liquidators, have the option of payment.

The CHIEF CLERK: What does the judge's order do?

Mr. DAVIS: It refers all matters in dispute to Mr. Hawksley.

The CHIEF CLERK: I think it is quite right to go on with it.

Mr. DAVIS said he was quite satisfied with having the chief clerk's directions. There were then three summonses against shareholders who were in arrear of calls. The first, however, he must abandon, there having been a mistake made in the christian name of the person summoned. The second was the case of a solicitor holding five shares, on which he had paid £25, and there was £75 still due. The service of summons was proved, and the share register and share ledger produced, showing that the shares were standing in the name of the person summoned, and the order for payment was made with interest at the rate of 10 per cent. per annum, in accordance with the 33rd clause of the Articles of Association, from the date of the call to the date of the order.

The CHIEF CLERK said he could not make the shareholder pay the cost of the application.

Another summons of a similar nature was abandoned, in consequence of an irregularity in the service.

COURT OF EXCHEQUER.

WESTMINSTER, TUESDAY, JAN. 15.

(*Sittings in Banco, before Lord Chief Baron* KELLY *and Barons* MARTIN *and* PIGOTT.)

WARD *v.* THE GASLIGHT AND COKE COMPANY.

Mr. HAWKINS, Q.C., said this was an action brought by the plaintiff against the defendants, alleging negligence by their servants in managing the gas-pipes at Saville House, Leicester Square, by reason of which, or in consequence of which, an explosion took place, and a fire was occasioned which destroyed a good deal of property belonging to the plaintiff. Mr. Ward had been insured in one of the insurance companies, and this action was brought nominally by him but substantially for the benefit of the insurance company, to recover damages in respect of that alleged negligence. The jury found a verdict for the plaintiff, and it was agreed that the damages should be assessed by an arbitrator in the event of the verdict standing. He (Mr. Hawkins) had now to move to set aside that verdict—first, on the ground of surprise; secondly, on the ground that the verdict was against the evidence; and thirdly, on the ground of certain affidavits to which he should have to call the attention of the court. This was an action which had been already twice tried—once before the late Lord Chief Baron, who nonsuited the plaintiff, on the ground that there was no evidence of any negligence at all on the part of the defendants; and, secondly, before the present Lord Chief Baron, after whose summing up—the trial having lasted three days—the jury found a verdict for the plaintiff. He (Mr. Hawkins) had to submit to the court that no negligence at all was shown to have existed on the part of the Gaslight and Coke Company or their servants, and that, even supposing there were any negligence attributable to them in the management of the work they had undertaken to do, the accident—or rather the explosion which occasioned the fire that did the damage complained of—was not an explosion which was brought about by the negligence of the defendants, but by the gross negligence of a servant named Rose, who was in the employ of a person named Bloom, the occupier of that part of the house in which the fire took place. He desired also to show that the servants of the gas company did all that they could be reasonably called on to do with reference to the pipes which belonged to them; and, further, that that portion of the evidence which was relied upon on the part of the plaintiff, and which certainly seemed to have made some material impression with the jury, was evidence which took the defendants entirely by surprise, and that evidence he was now prepared with affidavits to contradict. The learned counsel having narrated the facts of the case as detailed in evidence upon the trial, proceeded to say that there was no question whatever that, upon the testimony of Cazally and Downs, the company's servants engaged in doing the work at Saville House, in the presence of Bloom and Larven the meter was taken down from the corner of the passage in which it had formerly stood, and that the gas was cut off by the turning of the main-tap on the day of the fire; so that, if no further interference had taken place, no escape of gas would have occurred, and no explosion would have resulted.

Lord Chief Baron KELLY: You say, "in their presence." Is that so? It was clearly arranged between them that the meter was to be taken away; and some further conversation took place, as to which the witnesses are at direct variance with each other. I think you will find that Bloom and Larven left the premises at a quarter past four, a little after or a little before Cazally and Downs left; but that during the time the meter was being removed they were in the billiard-room.

Mr. HAWKINS: They were backwards and forwards, and were perfectly aware of the fact that the meter was being taken down.

Lord Chief Baron KELLY: Oh, yes.

Mr. HAWKINS: And I do not think your lordship will say there was any question on this point, that the tap which turned off the gas in the corner of the passage was turned. No one pretended to say that there was any escape of gas till Rose, rightly or wrongly, in the afternoon of the day, came and turned on the cock.

Lord Chief Baron KELLY: Certainly not.

Mr. HAWKINS said he thought he might therefore fairly take it as the result of the evidence, that the flow of gas was cut off as in the ordinary course of things was done by the inmates of the house, and that, if the cock had not been turned on again, the gas could never have escaped, and the accident never have happened. There was a conflict of evidence, no doubt, between Larven, who was called on the part of the plaintiff, and Cazally and Downs, on the part of the defendants, as to what actually did take place when the meter was removed. Larven, in his examination-in-chief, stated that Cazally and Downs said they would take down the meter and connect the pipes; on the other hand, Cazally and Downs swore most distinctly that such a conversation did not take place, and when he (Mr. Hawkins) came to cross-examine Larven himself as to the exact expression made use of, he was compelled to confess that, when giving evidence before the late Lord Chief Baron, at the trial in December, 1865, he did not say that Cazally and Downs promised to connect the pipes, but that they would take down the meter and leave everything secure.

Lord Chief Baron KELLY: He could not deny that the word he used on the former trial was "secure," and not "connect."

Mr. HAWKINS said the shorthand notes put in showed that the word used was "secure;" and certainly, during the whole course of Larven's examination on the first trial, there was no evidence of any sort or kind given on the part of the plaintiff of any expression save this being used by the gas company's servants, nor was any statement made that they had ever promised to connect the inlet and outlet pipes of the meter, so that the gas could be used in the house that night by Bloom, as, unquestionably, he did endeavour to use it. Larven and Bloom saw the meter removed, and Rose

actually carried it into the cellar, so that all three were cognizant of the fact; and they must also have been cognizant of the fact that, unless a connecting-pipe had been put up, no gas could pass to the burners, but if the tap were turned must escape into the house, and no evidence at all was given of any request being made to have such a connecting-pipe. But towards evening, when lights were required in the billiard-room, the gas was turned on by Rose, who, finding that the chandeliers and burners would not light, went to the place where the meter had stood, mounted a pair of steps with a candle in his hand, and thus ignited the gas and caused the explosion. After calling attention to the discrepancies in Rose's evidence on this point at the first and second trials, the learned counsel proceeded to say that, supposing the case rested on the uncontradicted evidence of Rose, he apprehended there was not a particle of proof of negligence on the part of the servants of the gas company, and even if there were any want of care or due precaution on their part, the proximate cause of the accident was not their negligence, but the negligence of Rose, who had charge of the gas apparatus in the establishment, who knew the meter had gone, and who had no reason to believe there had been any connecting-pipe put up or even taken to the place. He was fully aware, having charge of the lighting arrangements, that if no such pipe was put up, the gas, on the cock being turned, must escape into the house, and yet he omitted to take the most ordinary precaution of turning off the cock before going to the spot with a lighted candle.

Lord Chief Baron KELLY: You see at this point the mischief really occurred, because Rose had not the slightest suspicion that the supply of gas was stopped. He knew that the meter had been taken away, but he had no intimation given to him that the supply of gas was stopped—at least that is what he swore, and what every person on the premises swore. He found the gas would not burn, and not being able to account for it after two or three times trying, he sent for a candle to see what in the world it was that prevented the access of gas to the burners; he went up the steps with the candle, and then the explosion took place.

Mr. HAWKINS: There had been a whistling noise heard in the corner previously, and I apprehend it was the grossest negligence on his part to take a candle there.

Lord Chief Baron KELLY: If the mischief arose partly from the negligence of the servants of the company and partly by the negligence of persons on the spot, the plaintiff is not bound to sue the whole of them; he may sue one or more of those who are liable for the negligence. However the jury found, in fact, that there was no negligence on the part of these people; and it is very hard to believe that if they had had the slightest idea the gas which came from the main, when they turned on the tap, would not pass up into the billiard-room, or into some safe receptacle, they would go into the corner with a light, which must be at the peril of the man's life.

Mr. HAWKINS: I do not suppose for one moment that Rose went up the ladder with the candle for the purpose of being blown down, but that he had forgotten the state of things, and imagined, what he had no right to do—that his master, Bloom, had done that which we suspect him of having done for a long time before.

Baron MARTIN: Are you arguing that the verdict is against the evidence?

Mr. HAWKINS: Yes.

Baron MARTIN: Surely that must depend upon my lord's impression upon it.

Lord Chief Baron KELLY: The whole question really depended upon the comparative credit to be given to Larven on the one hand, and Cazally and Downs on the other. Cazally and Downs positively swore—and they were certainly two to one, for you know Bloom was a German and could not understand what passed——

Mr. HAWKINS: Bloom had absconded.

Lord Chief Baron KELLY: I say you have the advantage of saying your evidence was two to one. Bloom, as you say, had absconded; and if he had been there, he was a German and could not tell what passed between Cazally and Downs on the one hand, and Larven who interpreted between him and them. Cazally and Downs swore most positively that when they told Larven, on the Monday, they were going to remove the meter the next day, and when, on the Tuesday, they told him they were going to remove it in the course of the afternoon, they also told him the supply of gas would be stopped, and that the apparatus must not be used. On the other hand, Larven swore as positively, over and over again, that they never told him anything of the kind; and though they told him what they were going to do as to the removal of the meter, they left him under the profound impression and belief that the supply of gas was to go on, either by a connecting-pipe or some other means; that they might light the billiard-room as usual; and that no danger could arise from what they did. The whole question was, which of these two stories were correct?

Mr. HAWKINS: I will assume, for the purpose of my argument, that Cazally and Downs said nothing that would give notice of the gas being discontinued.

Lord Chief Baron KELLY: What took place immediately before the fire happened may be extremely important, to show that the fire was occasioned partly by the negligence of Rose and others employed upon the premises; but, as I say, the great question left to the jury, and to which their attention was directed throughout the whole trial—though there were a number of subsidiary and collateral points, and when I came to sum up the matter to them I did not fail to call their attention to the collateral questions as they arose—but the great question was, whether these people, when they had arranged with Bloom, through the interpretation of Larven, that the meter was to be removed for a few days, that a 30-light meter might be substituted in its place, gave the slightest reason to Larven and Bloom for the supposition that there would not be a connecting-pipe, so that the gas could continue to be used. That raised the question of probability that, when they were going to take away the meter and supply another, they would have said immediately, "You must do something to let the supply of gas go on," for they had let the place to Roth, and Roth could only use the premises by carrying on his business as a billiard-table keeper. And it would seem—and so the jury thought—that if the least intimation had been given to these people that the supply of gas would be stopped, they would have said, "Do not stop the gas, and with it our trade and Roth's business." But, on the contrary, it was sworn positively by Larven that, from all that passed between them, they were left under the impression they might light the gas as usual; and it was under this impression Rose swore also that, not having the least idea the supply of gas was stopped, but finding the gas in the billiard-room would not light, he went into the corner, turned on the gas, and did everything he could imagine to ascertain the reason why he could not get a light; and at last, no one knowing anything about it, every person trying to light the burners and failing, he got a candle, and went up the steps—I think it is not important whether he put the candle on the shelf or not—then a quantity of gas having escaped from the orifice of the pipe, from the attempt to turn on and light the burners above, an explosion took place, and the fire was occasioned. But it all came back again to the question of what passed between Larven and the company's servants.

Mr. HAWKINS: Your lordship says that Larven was under the impression a connecting-pipe had been put on. Now there was not a particle of evidence, on the part of Larven or any one else, that any intimation had been given by the gas company's servants that there would be a connexion of that sort.

Baron MARTIN: His lordship has not said so.

Lord Chief Baron KELLY: I shall be glad to hear—for it is a case of great importance, and was determined the other way on the first trial—I shall be glad to hear all the points you have to urge in support of your motion for a new trial, but I wish you to consider what was urged on the part of the plaintiff most forcibly upon the jury over and over again—that when the servants of the gas company were about to remove the meter, the effect of removing which, if nothing more was done, was to leave a large pipe with its orifice open, so that, on turning on the gas (supposing they took no steps to fill it up, or, having covered it up, the covering was taken away or fell off), the necessary consequence would be the escape of gas in large quantities, attended with danger, in the premises—what was urged was that it was the duty of these people to say, "You must take care you do not attempt to use the gas; we shall stop it off as well as we can, but do not attempt to use it." But there was nothing of that kind. The case was that Rose, who had the management of the gas, never imagined for a moment that the apparatus had been left in such a state that on proceeding to turn it on it would at once escape. He went down and attempted to turn it on; and if there had ever been a covering, or cap, or bung on that pipe—as your witnesses swore positively there was, and as the other side contended there was not—it had fallen out or been removed, and in consequence of this, the unfortunate man Rose going there, little dreaming there had been any stoppage of the gas, or any change in the mode of supply, when the candle came the explosion took place.

Mr. HAWKINS: Surely, my lord, the man knew perfectly well that the two pipes had been disconnected—for Rose is not a man who was unacquainted with the meter—he knew that it had been taken away, and that the two pipes had been disconnected.

Lord Chief Baron KELLY: He did not know that they were disconnected. You may contend, if you please, that he did, and you gave a good deal of evidence, not only that Bloom was told through Larven, but that Rose also was told the connexion was broken between the two pipes; but, on the other hand, Rose positively swore that he did not know, and it was one of the points I left to the jury. You must not take it for granted that it was as you state, for on this, as on almost every other point, there was some contradiction. I left every point to the jury, whether I thought it material to the issue or not, and I left it with such observations as occurred to me. I told them at the beginning and at the end of my summing up that the verdict was theirs, and not mine, and that if anything fell from me which looked like dictating, or stronger than suggesting my view of the case, they were only to take it for what it was worth, and form their own opinion upon the whole. I am directing your attention to that so that you may not assume anything sworn to by your witnesses must be taken for granted as a proved fact in the case.

Mr. HAWKINS: I do not say there was notice. I am taking it for a moment on the supposition that Cazally and Downs were to be disbelieved in the statement they made, that they did give notice to Bloom and to Larven the gas could not be used; still, I say there was no affirmative evidence of any statement made, either to Larven, or to Bloom, or to Rose, that the gas could be used—there was no intimation given that any connexion had been made. The only notice they had was that the meter was gone, and though they might choose to entertain the impression that a connecting-pipe was put up, they were not warranted in so doing from anything said or done by the gas company's servants on that occasion.

Lord Chief Baron KELLY: That was one of the questions left to the jury—whether there was negligence, or whether it was consistent with ordinary care, that when the meter was removed there was sufficient notice to the parties.

Mr. HAWKINS: Supposing the company's servants had simply said to Rose, we have taken away the meter, would not that have been an intimation to Rose that the connexion between the inlet and the outlet was broken?

Lord Chief Baron KELLY: That must be for the jury. It was proved that a connecting-pipe could be put up easily and in a moment, and the question is, whether any person on those premises, knowing the gas was used for the purpose of lighting the concert-room and the billiard-room, and not only these rooms but that the very passage into which people would come, was lighted by means of this gas-meter, would dream that the whole business of the place was to be stopped for three or four days? The question is, whether any person, knowing the meter had been taken away, would not take it for granted that by a connecting-pipe or other usual means on such occasions the supply of gas would be continued?

Mr. HAWKINS: Surely there must be some intimation of that fact besides the taking away of the meter. Cazally and Downs suspected Bloom.

Lord Chief Baron KELLY: Bloom went away at a quarter-past four, and did not return till six o'clock.

Mr. HAWKINS: That does not militate against my argument, for Rose, who knew his master, might suppose he had done it.

Baron MARTIN: If this is simply that the verdict is against the evidence——

Mr. HAWKINS: We say there was no evidence of negligence.

Baron MARTIN: Is not the impression of the judge who tried the case enough? When the judge left it to the jury, and in his opinion their verdict is a right verdict, there is an end of it.

Mr. HAWKINS: Then I will change my ground to misdirection in leaving it to the jury. First of all, I say, supposing nothing more had been done to the pipe—for the gas-fittings are the fittings of the tenant, and not under the control of the gas company's servants at all; the meter, and the meter alone, is all the property that belongs to them—I apprehend that as far as the gas company's servants duty is concerned, all they had to do was to take care that when they removed the meter the gas could not escape. They did that by turning off the main-cock, and if Rose, or somebody under him, had not turned it on again, there never could have been an escape into the house of one single foot of gas.

Baron MARTIN: Then they would be guilty of no negligence.

Mr. HAWKINS: That is exactly what did occur.

Lord Chief Baron KELLY: There was an issue upon every point. There was, in the first place, an issue upon which a good deal of evidence was given, as to whether you did put on the cap.

Mr. HAWKINS: I am not upon the question of the cap at all, but whether

the gas was turned off at the main-cock 6 feet above the level of the passage.

Lord Chief Baron KELLY: Turned off, but so that it could be turned on again.

Mr. HAWKINS: It was turned off by means of a moveable key, which took on and off, and when the key was removed no human being could turn it on.

Lord Chief Baron KELLY: Then why was it not taken off and put away?

Mr. HAWKINS: For the best of all possible reasons—it did not belong to the gas company. They had no more right to take it away than your lordship.

Baron PIGOTT: What was done with it?

Mr. HAWKINS: It was put down in a corner behind the pipe. When the men left the premises the gas was actually turned off, and until it was turned on again, first by Roth, and secondly by Rose, there was no escape of gas in the house. But for the interference of Rose or Roth, who turned on the gas in the course of the evening, the explosion could not have taken place.

Baron MARTIN: Supposing that is so.

Mr. HAWKINS: It is not disputed. Then what negligence is there on the part of the company's servants?

Baron MARTIN: If you ask me, I should say I suppose the jury thought that when they took the meter away they should have given notice to the people in the house not to interfere or allow the gas to be used.

Mr. HAWKINS: Certainly until the end of the case that was not made a point of. The great point was, whether or not the gas had been properly turned off, and whether a cap or bung should have been used.

Baron MARTIN: I remember it all now. The bung was the thing it was moved upon a year ago.

Mr. HAWKINS: This is a most important matter, not only for the plaintiff, but for other parties. There are eleven actions which must be tried, and therefore it is important to have the matter fully ventilated before further proceedings are taken.

Baron MARTIN: Eleven actions arising out of this fire?

Mr. HAWKINS: Eleven at present. There are seventeen claims, my lord, and at present eleven actions have been brought. Now, in the declaration there is not a single syllable said with regard to the omission of notice, and until the last morning of the trial I never heard it alleged at all.

Lord Chief Baron KELLY: The cross-examination of Larven, so ably conducted by yourself, was as to whether the expression used by Cazally was "connect" or "secure." Was not that directed to the very point as to whether Larven and Bloom had not been led to suppose the pipes were so connected as that the gas would flow into the billiard-room?

Mr. HAWKINS: Not to the question of notice. If Larven had been told that the gas company's servants would put a connecting-pipe, so as to make that a part of their duty under the contract with Bloom, and had omitted to do that and to give information that they had not done it, there might be some ground for this proposition. The great struggle of Larven, on the last trial, was to show that there was a promise to put a connecting-pipe, which he had said the reverse of on the former trial; and it was for the purpose of displacing the plaintiff from this ground that I cross-examined him, and to show that there was no promise to put on a connecting-pipe. But certainly the question of notice was not adverted to until the last morning, and not, I think, until your lordship began to sum up.

Baron PIGOTT: What is the negligence charged?

Mr. HAWKINS read the declaration, and said: Down to the last hour the attention of the jury was directed to the point whether the company's servants had taken precautions to prevent the gas escaping, and not whether they had given notice to the parties in the house.

Lord Chief Baron KELLY: Then to what did you apply the repeated questions in examination and cross-examination—first of Larven, and afterwards of both Cazally and Downs—as to whether they had said anything or not that the gas was not to be used, and that the supply of gas had ceased?

Mr. HAWKINS: For the purpose of establishing the fact that they knew the meter had gone.

Lord Chief Baron KELLY: You see no human being could have suggested a doubt that the meter was gone. The arrangement made between Bloom, through Larven and Cazally, and the other man, was that the 50-light meter was to be taken away and a 30-light meter brought. The only question was whether they were not left under the impression that some kind of connecting-pipe would be put up in the interval so that they could continue to use the gas.

Mr. HAWKINS would ask, then, where was the negligence on the part of the gas company? They did all they could be expected to do to stop the escape of gas, for though they might have used other precautions, yet when they had finished taking away the meter, and had left the tap in such a state that, but for the active interference of some one in the house, no escape of gas could occur, they did all that they were bound to do. What followed arose out of the negligence of the man who turned on the gas, and not out of the negligence of the gas company's servants. The learned counsel proceeded to state to the court the nature of the affidavits upon which he supported his motion for a new trial. He reminded the Lord Chief Baron of the evidence given by Cazally and Downs, and Sewell, to the effect that the state of the 50-light meter was taken when the former occupant of the billiard-room gave up possession in March, 1864; that on several occasions subsequently it was examined, and found to be in the same condition up to the period when Bloom took the house, but that when it was examined in the following February it was discovered that a large quantity of gas had been surreptitiously passed through it, Bloom having no contract with the company for a supply through that meter. At the conclusion of the case, to the great surprise of the defendants, some persons not called on the first trial were brought forward to swear that the statements of the defendants witnesses could not be true, that gas had been consumed in the house during the interval of Roberts's and Bloom's tenancy, and that no person from the gas company had ever during that period visited the place and inspected the meter. Upon this evidence he (Mr. Hawkins) had an affidavit, first of all, that the defendants were taken by surprise. His lordship, in summing up, told the jury that he (Mr. Hawkins) had not imputed perjury to Mrs. Reardon in these statements. He did not know how he could have done so with the materials he then had before him, because the witness was suddenly thrust upon the defendants at the end of the case, without a single previous intimation that she was about to be brought forward. He had, therefore, no materials to cross-examine upon, no opportunity of examining into her character or of producing any evidence in contradiction to her statements. It would have been worse than idle, and would have prejudiced his case, had he then asked the jury to discredit her evidence; but he had now the materials by him for so doing. He had the affidavits of persons who spoke to having gone with Cazally and Sewell to Saville House upon several occasions between the months of March and September, 1864, and to having seen Mrs. Reardon upon the premises, and they further stated that on one occasion they assisted in putting tow in the inlet-pipe of the meter in the very presence of this woman. If he thus succeeded in showing that Mrs. Reardon's statement was not true, but that Cazally and Sewell's statements were true, and if he could account for the fact that Mrs. Reardon might have been burning gas, and yet no indication of it appear on the meter, he apprehended he should have done a great deal.

Lord Chief Baron KELLY: You will have done a very great deal if you can account for that.

Mr. HAWKINS said he had affidavits to prove that which the defendants were unprepared to prove on the trial, because this evidence came upon them at the last moment—viz., that it might so happen that small quantities of gas might from time to time pass through a meter of this size, which was not a new meter, without being registered on the index at all. He had the affidavits of four or five gentlemen—meter testers of eminence and experience—perfectly independent witnesses, who stated that when a meter was as this one was, four or five years old, although it might be a perfectly good and proper meter to mark the progress of gas through it in anything like the large quantities necessary to supply 50 or 60 lights burning at the same time in one evening, yet when such small quantities as would be required for 3 or 4 burners was being consumed, the gas passing through it would not be registered at all. So that it might be perfectly consistent with fact that 2 or 3 burners might have been in use as stated during those months, and yet the index of the meter remain at the same point at the end of the time, as sworn to by Cazally.

Lord Chief Baron KELLY: You say your affidavits state that gas to the amount of 2 or 3 cubic feet might pass through the meter without being registered—that is, that burners, some three or four in number, could be lighted throughout a period of six months.

Mr. HAWKINS: There were only two at the outside.

Lord Chief Baron KELLY: Two in one room and three in another.

Mr. HAWKINS said he would read the affidavit of Mr. Henry Airey, who had been an inspector of gas-meters for many years, and had had a great deal of practical experience on the subject. The deponent stated he had found in the case of both wet and dry meters, but more particularly in dry meters, that after they had been in use for some time, although they would register correctly the quantity of gas passing through them when the full or a considerable number of burners were lighted, they would not register small quantities passing through them from time to time. This arose, he stated, from the fact of the valves becoming worn out, and from the condensation of matters given off by the gas during its progress being deposited on the valves. This was one of several affidavits.

Baron MARTIN: What is the bearing of that?

Mr. HAWKINS: It goes a long way towards reconciling the testimony of Mrs. Reardon and the witnesses for the defence.

Lord Chief Baron KELLY: It will only go to account for her evidence without damaging the character of Cazally and Sewell. You see the thing itself is of no importance.

Mr. HAWKINS: I admit that it was not of importance; but, if the jury believed the evidence of Mrs. Reardon, it went to the discredit of Cazally; and Cazally, being the main witness on the part of the defendants, and being discredited by the evidence of Mrs. Reardon—for if that was believed he could not be speaking the truth—it became in that sense material.

Lord Chief Baron KELLY: Yes, and I called the attention of the jury to the evidence, for it certainly seemed to me then—and notwithstanding your affidavits it seems to me now—an extraordinary circumstance, though no doubt it may be true, that persons can use two or three burners a night, if only for an hour or two, for the space of six months, consuming some 2000 or 3000 feet of gas, and that that should have no effect upon the index of the meter. These two persons swore most positively that the index stood at the same point in March, when Roberts left, and in September, when Bloom came. I thought myself bound to point this out to the jury, and, though the thing was not in itself of great consequence, whether this woman properly or improperly used the gas for the purpose of lighting her rooms, it is important in relation to the character of Cazally, because upon the character of Cazally the case for the defendants mainly rests—if he is discredited in any particular which would go not so much to the accuracy of his memory as to his veracity. Therefore, you are quite right as to the fact that the case entirely rests upon the credit due to Cazally.

Mr. HAWKINS: What I am seeking by these affidavits is, to remove the discredit cast upon Cazally's testimony, and to leave him fairly to have his testimony weighed by the jury. But it cannot be fairly weighed by the jury if they find and believe that in one part of the story he has told—as to his visiting the premises, and examining the state of the meter, and finding it in the state it was—he is contradicted. They must disbelieve him on the ground that he has stated that which is wilfully untrue, for he swore that he went there and examined the meter.

Baron MARTIN: Did he use any book or make any entry at the time?

Mr. HAWKINS: Yes; and we have the books and the entry—not made at the time in the sense of being written in the book at once, but a memorandum made, and entered afterwards. There is a remarkable thing, too, with regard to this gas-meter, which has come to our knowledge since the trial—viz., that this very meter of which the insurance company, who are the plaintiffs in this action, have produced a model, and about which there was some discussion as to whether it was a true and correct model, was at the time in their possession and within their control.

Lord Chief Baron KELLY: I do not understand what you mean. Do you mean that the plaintiff is in possession of the meter?

Mr. HAWKINS: Yes.

Lord Chief Baron KELLY: Did you suggest at all that it should be produced?

Mr. HAWKINS: I had never heard about it till I saw these affidavits.

Lord Chief Baron KELLY: I do not see how it affects the case, even if you had it lying on the table. I think, with reference to the affidavits produced, you had better allow the court to be put in possession of the whole, so that they may judge for themselves what effect upon the verdict this evidence would have, if any.

After some conversation as to the time for resuming the argument, the case was adjourned.

THURSDAY, JAN. 24.

Mr. HAWKINS said their lordships would remember that, on the former occasion, he was proceeding to deal with the affidavits in support of his motion. Their lordships asked him, at the close of his observations, to point out more particularly how the case was affected by the evidence of Mrs. Reardon. He might mention that there were several actions, he would not say how many, already pending arising out of the same accident, and

there were also others threatened. He believed there were six of these actions for trial in this court, so that, whatever might be the result of the present motion, the questions at issue would have to be tried again. It was important, then, to call attention to those matters, which on any other trial could be brought forward to resist the evidence adduced on the last. The case, so far as regarded the rebutting of the supposed negligence, depended mainly upon the evidence of Cazally and some portion of the evidence of Sewell, a former inspector of the gas company. The negligence which, during the summing up, the Lord Chief Baron put to the jury was the not giving express notice to the people in the house that the meter had been removed, and that the gas could not be turned on. The defendants said that that was a point which had never been previously made, either in the course of the first trial or the second, until his lordship was summing up the case to the jury. What had heretofore been said on the part of the plaintiff was that the defendants negligence consisted in not taking further precautions to prevent the possibility of the gas being used beyond turning off the main-cock; that they ought to have fixed on to the end of the inlet-pipe where it joined the meter either a brass or an iron cap, or that in some other way they ought to have made the thing secure; and that, if they had done that then, even if the tap were turned, no gas could have escaped. On the part of the defendants it was contended that, even supposing there would have been negligence in not taking some precaution—in not fixing something on to the inlet-pipe—still they did take that precaution, because before the meter was finally removed, and before the gas company's servants left the premises, one of them, a man named Downs, in the presence of Cazally, took a bung, and, having coated it over with white lead and grease, pushed it into the orifice with his hand, and then hammered it in perfectly secure. There was evidence also of a very strong character to show that if the bung had been placed in that pipe, it would, for all purposes required, seeing that the explosion took place within three or four hours afterwards, have been sufficient as a temporary stoppage.

Lord Chief Baron KELLY: Might have been.

Mr. HAWKINS: There was no evidence of any kind or sort to prove there was any danger to be anticipated, unless the bung had been wilfully removed by some person who was desirous fraudulently to take the gas.

Lord Chief Baron KELLY: No doubt, if the bung were of the proper kind, and well and skilfully put into the orifice of the pipe. The evidence on both sides went to prove that would be a sufficient precaution, though there was certainly some evidence on the part of the plaintiff that even that was not sufficient.

Mr. HAWKINS: Still I think your lordship's impression was that if the bung had been properly placed in, it would be certainly sufficient for a temporary purpose—certainly sufficient for half-a-dozen hours; and we must recollect that the explosion took place three hours afterwards.

Lord Chief Baron KELLY: A proper bung—that certainly was my impression.

Mr. HAWKINS: Now the evidence we gave with respect to the bung was the evidence mainly of Cazally and Downs, and if that evidence was to be believed, it was done in a proper manner. None of the plaintiff's witnesses said they saw the bung put in, and that it was an improper bung, or improperly put in. Their evidence was that there was no bung put in at all. The only evidence, if it was to be believed, was that it was a proper bung, and that it was forced in by hammering.

Lord Chief Baron KELLY: The evidence upon that point really was, as you have correctly stated, one of the great and crucial points, and it was of the simplest possible character. If Cazally and Downs were to be believed, a proper and sufficient bung was properly and sufficiently introduced into the orifice of this pipe. If, on the contrary, Rose is to be believed, no bung could have been put in; for one of the witnesses—I think it was Cazally—said he obtained altogether three bungs of Rose, two of which were applied to the meter, and one to the pipe. That was the defendants case, but Rose himself said that only two bungs were used. This is the evidence on the one side and the other upon this point.

Mr. HAWKINS: Then it was of the most vital importance that the credit of Cazally, which was to be submitted to the jury as against the evidence of Rose, should be unimpeached, and if circumstances in the course of the trial were introduced which tended to show that Cazally had been speaking untruly, of course, his credit being impeached, his evidence with regard to the bung would be disbelieved; and if his evidence was disbelieved, it also threw discredit upon Downs, who speaks to the same thing as Cazally had done. For the purpose of contradicting Cazally and Sewell with respect to the state of the meter, and to an alleged abstraction of gas, it was proposed on the part of the plaintiff to call several witnesses to give evidence in reply. I objected to the reception of that evidence, on the ground that it was evidence which ought to have been given in chief. However, the Lord Chief Baron received the evidence, and the witnesses were examined; and certainly there was no part of the evidence given in the whole course of the trial upon which more stress and reliance was placed by the Lord Chief Baron.

Lord Chief Baron KELLY: As affecting the evidence of Cazally.

Mr. HAWKINS: My affidavits are rather directed to show that those witnesses ought not to have attributed to them the value which was attributed to them by the jury, for their evidence took us entirely by surprise. Upon the occasion of the first trial, which took place in December, 1865, upon precisely the same evidence which was given before his lordship down to the close of the defendants case, the late Lord Chief Baron was of opinion there was no case to go to the jury.

Lord Chief Baron KELLY: Let me correct you as to the observation you first made, that this evidence ought to have been given, and could have been given, in the plaintiff's original case. The only object of evidence was this—to prove that it was impossible Cazally's account could have been true, that the state of the meter, which showed a consumption of 540,000 feet or thereabouts in March, remained unaltered in September, at the time when Bloom came into possession—the evidence to that fact was given only by you.

Mr. HAWKINS: But, my lord, I said it should have been given in chief.

Lord Chief Baron KELLY: It was a perfectly immaterial point; it only went to the question of whether Bloom had surreptitiously used some 40,000 feet of gas.

Mr. HAWKINS: I suggested, on the part of the defendant, that Bloom would have endeavoured surreptitiously to obtain gas after the meter was gone by means of a connecting-pipe, and to show that Bloom was a thief as I charged him with being.

Lord Chief Baron KELLY: It affected the probabilities of the case in more than one point; but you gave that evidence for the defendants after the plaintiff's case was closed, and it was to meet that evidence, and to show that Cazally could not be correct, these witnesses were called who had occupied the upper apartments in the building, and they showed that they had burned the gas which came through that meter from March to September, in small quantities no doubt.

Mr. HAWKINS: It was not merely that, but for the purpose of showing that what Sewell swore was untrue, because he swore, and Cazally swore, that between the month of March, when Roberts ceased to occupy the billiard-room and to use the 50-light meter, and the month of September when the new tenant came in, they, on more than one occasion, went to the premises and took the state of the meter, and placed tow in the pipe to prevent its use. This woman, Reardon, was called for the purpose of showing that could not be true.

Lord Chief Baron KELLY: That was not important, because they might have called and she not have noticed it, or have forgotten it; but the important point—and I own that it struck me as of a character which could not be explained away—was as to the unaltered state of the meter.

Mr. HAWKINS: Although, unquestionably, the evidence given was not on a material point——

Baron MARTIN: It was on a perfectly immaterial point, and if the evidence was immaterial my lord could not admit it.

Lord Chief Baron KELLY: It was not material as to the issue, but it was most material as to the evidence of Cazally.

Mr. HAWKINS: I quite agree that it was immaterial as to the issue, because whether the state of the meter was taken in April or a month earlier or later, or not at all, would not make any difference on the question of negligence.

Lord Chief Baron KELLY: You may go further, and say that whether Bloom was a thief or an honest man was quite immaterial to the question whether any notice was given to the inhabitants of the house that they must not use the gas, and whether or not the pipe was left in a sufficiently safe state upon the removal of the meter. These were the two great questions, and a variety of other questions arose affecting the probabilities of the case, such as whether Bloom was an honest man or whether he was capable of stealing—for that is what it came to—a quantity of gas during the three or four months from September to the fire, and whether he was equally capable of resorting to some contrivance—not personally, for he went away—but of allowing some one or other to take out the bung and introduce some machine or apparatus for connecting the two pipes which had been severed.

Mr. HAWKINS: Of course, if he could do that, it would account for Bloom being utterly indifferent to the meter being taken away. He would have his connecting-pipe and take it fraudulently, as I said he had done, to supply his wants; therefore, though in one sense the evidence was not material, it was of mighty importance when we come to the consideration whether Cazally, who was the main witness on the part of the defendants, was speaking the truth, for if the jury believed that Cazally was wilfully telling an untruth, I do not wonder at their finding the verdict they did. And that they did think so seems to me beyond all question, when I turn to your lordship's summing up and see the importance attached to the evidence of Mrs. Reardon.

Lord Chief Baron KELLY: Let us be quite sure that your note and my report agree as to what it really was. At present I tell you I attach little importance to the contradiction as to Cazally and Sewell having been once, or twice, or three times to the premises. That was the contradiction of Mrs. Reardon, but as to which party was correct I consider of very little importance, because really, you know, a man may call three or four times in the course of six months at a certain place, and the door may be opened to him by the housekeeper, and there may be a conversation between them, and yet the housekeeper may forget the circumstance. But the other point was vital, and one upon which they could not be mistaken. They swore, not for the cause, but to throw discredit upon Bloom and to support your charge, that he had embezzled or misappropriated your gas; that the state of the meter having been taken in March, and having been taken again in September, when Bloom came into the premises, was found the same; that in March the quantity that had been used was 540,000 feet, and in September it was exactly and identically the same quantity. That was a most important issue, because inasmuch as a great deal—some 40,000 feet—had been used between September and February, it was said that Bloom had used these 40,000 feet of gas improperly. He said he had used a great deal of it, but he did not know whether it came through the other meter or not. The question was whether the indicator of the meter was at the same point in September as in March; and upon that Mrs. Reardon, who knew nothing about the state of the meter, told us that from March to September she occupied two rooms on the premises, which were lighted, the one with one or two burners, and the other, I think, by two or three, I do not remember which, and the gas to supply those rooms passed through this meter. If they did occupy those premises and used the gas nightly from March to September, although it was summer-time, the meter, I should think, would show the quantity consumed. There was no suggestion to the contrary at the trial, but, as I understand, your affidavits now suggest the contrary.

Mr. HAWKINS: My ground is that this evidence came upon us entirely by surprise; that the same evidence having been given as to the state of the meter upon the first trial, in 1865, there was no attempt made to prove those facts which Mrs. Reardon was now called to prove; and that we had no reason to suppose she would be called at the last trial. This was the first we had heard of it, and it would rather have tended to prejudice our case with the jury, if had suggested that this person was committing perjury in the witness-box.

Baron PIGOTT: Was there only this one witness called?

Lord Chief Baron KELLY: There were two or three persons connected with the family, but the others were only there occasionally. I do not now understand you to impute perjury to Mrs. Reardon, except in relation to her having seen Sewell. All you now say is, that the whole quantity could have been consumed between March and September for these two rooms, but that it would not have affected the indicator of the meter—that the meter would not have shown the consumption of 100 cubic feet.

Mr. HAWKINS: Quite so. My affidavits also go to this: I do contradict Mrs. Reardon—whether to the extent of making her guilty of perjury, I care not—but I do contradict her, on the statement of three or four persons. Her statement tended to show that there had been wilful fabrication on the part of Cazally and Sewell, if she were to be believed, for she said she was the only person who opened the door.

Baron MARTIN: The matter comes really to this: there was no misdirection, no improper rejection of evidence, no improper admission of evidence; therefore, there is no ground for granting a new trial because the verdict is against the evidence. On the first ground, it is a matter for my lord, if he is satisfied with the verdict. The Lord Chief Baron says he is satisfied with the verdict, and there is an end of the matter as to the verdict being against the evidence.

Mr. HAWKINS: I submit that if the judge's opinion is to be conclusive you may as well dispense with a jury altogether.

Baron MARTIN: After a trial has lasted three days, and the judge is satisfied with the verdict, I think it is not a matter of counsel's opinion whether a verdict is against the evidence.

Mr. HAWKINS: I protest, as far as I can, against the doctrine that a party is to be satisfied with the impression of the judge as to which way the verdict should be, and that there is to be no appeal from him.

Baron MARTIN: That will not do.

Mr. HAWKINS: If that is so, it is as well that it should be publicly known, and stated from the bench as a matter of law, namely, that if the judge is satisfied with the verdict, it is futile to appeal to the court *in banco*, and that they are really nonentities.

Baron MARTIN: It is already perfectly well known, and has been for the last thirty years.

Mr. HAWKINS: Does your lordship mean to lay it down as a matter of law?

Baron MARTIN: It is a matter of practice.

Mr. HAWKINS: Then it shows how futile it is in practice to make an appeal against the judge who tries the case.

Lord Chief Baron KELLY: I think you may reasonably and properly enter into the question to any extent you think proper, independent of the matter of the affidavits. I should be most earnestly desirous, if my learned brethren should take a different view of the evidence from that which I took on the trial and still entertain, that the rule for a new trial should be made absolute.

Mr. HAWKINS: May I respectfully ask what earthly use it is arguing the case, if one member of the court says he does not care what the evidence is, and that he will not exercise his judgment upon it, if the Lord Chief Baron is satisfied with the verdict.

Baron MARTIN: That is the view with which I spoke.

Mr. HAWKINS: That is as much as to say, if the Lord Chief Baron is satisfied with the verdict I will not exercise my judgment upon it.

Lord Chief Baron KELLY: I do not think Baron Martin's opinion goes so far as that.

Mr. HAWKINS: In substance it is so.

Baron PIGOTT: I do not think that you and Baron Martin are *ad idem*. He merely says that the judge's report upon the evidence is more valuable than the arguments of counsel on one side. He does not say that upon the affidavits there may not be ground for the motion.

Mr. HAWKINS: I think we are *ad idem*. Baron Martin says that, on the question of whether the verdict is against the evidence, he feels bound by the opinion of the judge who tries the case.

Baron PIGOTT: *Primâ facie*, that is so. It is the practice; we have always acted upon it.

Lord Chief Baron KELLY: There is no inflexible rule to that effect. This very term we have granted a new trial on the ground that the verdict was against the evidence, though the learned judge who tried the case had reported that he was perfectly satisfied with the verdict. The rule was granted, and the report was read. Counsel were heard upon both sides on that rule, which was made absolute. Therefore, you must not take it as an inflexible rule. It is a rule of practice on which the judges have acted, and I think wisely acted, where it is a mere question as to the decision of the jury upon conflicting evidence, and where, in addition to the verdict of the jury, there is the decided and clear opinion of the judge that the verdict is right; but I hope it will not be considered that there is anything approaching to an inflexible rule on the subject, which is not open to exception in particular cases.

Mr. HAWKINS: I am quite certain your lordship never intended to lay down an inflexible rule of the kind, and that if you saw grounds for correcting the view which you took at the trial, you would desire to have it listened to. But after the opinion expressed by Baron Martin as to his being bound by the opinion of the judge, I feel the difficulty of proceeding with the case, and that it would be a mere waste of breath, and therefore I will not proceed.

Baron PIGOTT: You really had exhausted the subject the other day upon the question whether the evidence justified the verdict, and the only matter to consider was the effect of the affidavits.

Mr. HAWKINS: I should have done with it but for what Baron Martin said.

Baron MARTIN: If you will only hear Baron Martin, you will know what I intended to say, and which I was prevented from saying by your interruption. When a case lasts three days, and the jury have found a verdict on conflicting evidence, and the judge before whom it is tried says he is perfectly satisfied with the verdict, and that it is right, I, for one, will not grant a new trial on the ground that the verdict is against the evidence. But, I was about to add, you are now moving upon affidavits, and if your affidavits are such as to show that, notwithstanding the judge is satisfied with the verdict, there are circumstances which may render a new trial necessary, you should read your affidavits that we may see what they are, or be good enough to hand them up and let us read them. I think your case is resolved into aye or no—shall we grant a new trial upon the affidavits? That is what I was going to say when you stopped me.

Mr. HAWKINS: I beg your lordship's pardon if I interrupted you; but it still appears to me that I gave a correct version of what your lordship said—that you for one would not interfere if the judge who tried the case is satisfied with the verdict.

Baron MARTIN: I mean that if a judge, having his senses about him, is able to form an opinion whether a verdict in a case tried before him is right or wrong, I should be guided by his opinion, where the only question is whether the verdict is against the evidence.

Mr. HAWKINS: That assumes the infallibility of the judge who tries the case.

Lord Chief Baron KELLY: Without arguing the point further, I think you had better proceed.

Baron PIGOTT: I presume the imputation about Bloom comes from you in the first place?

Mr. HAWKINS: Yes.

Baron PIGOTT: He was not a witness?

Lord Chief Baron KELLY: No; he has absconded.

Baron PIGOTT: You attacked Bloom?

Mr. HAWKINS: Yes, and I gave the reason for it. My case is this—Bloom is a thief; he stole 44,000 feet of gas, as we believe he did, for we found the meter which in March stood at 540,000 feet, in February following stood at 584,000 feet, though when Bloom went there in September it still stood at 540,000 feet, and although there was no contract for the use of gas through that meter.

Lord Chief Baron KELLY: There was no doubt that, whether honestly or dishonestly, Bloom had used something between 30,000 and 40,000 feet of this gas, because it had lighted the billiard-room and other apartments in the house during the whole time it was occupied by him from September to February. He said he was not aware but what the gas he used passed through the 100-light meter, which he had hired, and from which he was entitled to take whatever gas he thought fit. That is the way in which it was sought to be defended. You, however, said he was a dishonest man, and stole the gas, perfectly well knowing that the gas came through the 50-light meter, and that Cazally was right in saying that 540,000 feet was what the meter indicated in March, and that no change whatever had taken place in it when Bloom came into possession. The result was twofold—first, that none of the gas had been consumed during the interval, or at least not a sufficient quantity to alter the position of the indicator; and secondly, that the whole of the gas used up to February must have been used by Bloom.

Mr. HAWKINS: Then came the question, had he dishonestly obtained and stolen it as I said he had? Now in the first place it is perfectly clear that Rose, who was the gas-man, must have known that the gas passed through the 50-light meter, because he always turned it on himself, and unless he had turned it on, no gas could ever have passed into the pipe supplying the burners at all. It was essential that that should be known by Rose, who was Bloom's servant.

Lord Chief Baron KELLY: Rose knew it perfectly. Bloom was a German; he was at the head of affairs, but he himself does not appear to have interfered at all with the gas. Rose was his servant, and to him was committed the duty of looking after the lighting of the whole of the premises by means of this gas. Rose knew perfectly that it was by gas supplied through this meter that the billiard-room was lighted.

Mr. HAWKINS: It is an unquestionable fact that no part of the 44,000 feet of gas has been paid for, nor had there ever been a contract to pay for it, nor for any supply through the meter, till the month of February, 1865, when the altered state of the index was observed. Some one, if Sewell spoke the truth, had fraudulently tampered with the pipes, because Sewell stated that in the month of April previously, after Roberts had left, he temporarily disconnected the meter, and into the supply-pipe he thrust a large quantity of tow to prevent any further quantity of gas passing into the meter until a new contract should be entered into by a new tenant.

Lord Chief Baron KELLY: If it be true that Sewell really did, as he swore, effectually stop up the pipe to prevent the supply of gas early in April, then the Reardons must be perjured, for they said they used the gas from April to September, or they must themselves be the persons who fraudulently took away the tow.

Mr. HAWKINS: I care not whether it is a mistake on the part of the Reardon's or perjury, as far as my case is concerned, but one or the other is the fact if Sewell is correct, for the tow must have been removed, and could only be removed for the purpose of enabling the persons who removed it to abstract gas which they knew had been stopped off.

Lord Chief Baron KELLY: It must have been by the Reardons.

Mr. HAWKINS: That will make my case stronger.

Baron PIGOTT: I understood that it was a conceded fact, or at least not contradicted, that the Reardons were using gas between March and September?

Mr. HAWKINS: Not conceded.

Baron PIGOTT: But proved, and not contradicted.

Mr. HAWKINS: It was proved by the Reardons themselves. There was no concession upon the subject.

Baron PIGOTT: Had they paid for any gas?

Mr. HAWKINS: Not a penny.

Lord Chief Baron KELLY: I do not know whether it appeared; perhaps you can tell me. This Mrs. Reardon was housekeeper at the time the premises were altogether vacant—whose servant was she?

Mr. HAWKINS: Morris, the landlord, I think, had placed her there to take care of them.

Lord Chief Baron KELLY: She took charge of the house, and occupied two rooms, and finding gas-burners in them, naturally, as any one else would have done, she lighted them—one was the room she lived in, the other was the kitchen—from the time she came till the month of September.

Mr. HAWKINS: If her evidence was believed that Sewell and Cazally never came to the house during the time she was there, the jury could not believe Sewell's statement that in the month of April he put tow in the pipe. They must have regarded his statement and that of Cazally as a deliberate fabrication and perjury; and, therefore, when Cazally came to the other part of his story about the bung having been placed in the pipe, they disbelieved that too. Your lordship upon the trial said to the jury—"It seems to me that if the evidence given by the plaintiff through Mrs. Reardon and the members of her family be true, it tends undeniably and irrefutably to show that the statements made by Cazally and Sewell cannot be true." I do not complain of what your lordship said, but I say that this evidence took us by surprise, and I will now tell you the evidence in reply. In the first place, I have the affidavits of Cazally and Sewell—I do not place so much reliance upon them—but I have also the affidavits of three other persons, who swear most distinctly to having gone to these premises during the period Mrs. Reardon says they never went at all, and they give circumstances and details of what actually occurred at the time they were there. [The learned counsel read the affidavits referred to, from which it appeared, *inter alia*, that Mrs. Reardon was present at the time the tow was put in the meter, and complained of the mess the men were making her steps in. A further affidavit by a meter-gauger, named Creed, was read. It stated that he assisted King, a fitter in the service of the company, since dead, to stop off the gas in the month of April, 1864, in the presence of Sewell, who told the housekeeper what had been done, and that they were let out by her when they left the premises. The fact of the visits of Sewell and Cazally to Saville House at the times referred to was also supported by the affidavits of persons named Pearson and Wright.] As to the consumption of gas by Mrs. Reardon, I have the affidavits of persons whose testimony is beyond all suspicion—*i. e.*, of highly scientific persons unconnected with the company, who state that where a meter has been in use some few years, there may be passing through it, by small degrees and in small quantities, hundreds of feet of gas, without the slightest indication of its passage upon the index of that meter.

Lord Chief Baron KELLY: Supposing your affidavits upon this point are fair ground to support this motion, it is quite necessary we should understand this. You see the point is a very simple one indeed. The Reardons swore they occupied these premises from March to September, and that during the whole of that time these burners were lighted with gas which passed through this meter. You say this might well be, and yet the indicator remain unaltered—*i. e.*, that 541,500 feet appearing to have been consumed in March, 541,000 feet and no more might appear on the index in September, although during the interval two rooms were constantly—though, perhaps, only one at a time—lighted by two burners supplied

through that meter. I should like to see what your affidavits say about that, because it is rather a startling proposition, and it is very important in considering whether you are entitled to a rule on the ground of surprise, it being evidence directed to a collateral and immaterial point.

Mr. HAWKINS: Do not suppose I rely upon that. I rely upon other parts of the affidavits.

Lord Chief Baron KELLY: Still it is upon a collateral point. I should like to know, if this be a matter of importance which the court must take into consideration, what you say as to how large a quantity of gas may be consumed without making any change whatever in the index of the meter.

Mr. HAWKINS: I will read just twelve lines of the first affidavit. This is by an official inspector of meters in the employ of the Metropolitan Board of Works:—"I have the official inspection and testing of all gas-meters used in the above district, and for many years have been practically acquainted with the mode of construction of gas-meters, and from my experience in testing gas-meters as required by the above Act, I find, both in the case of wet and dry meters, but more especially dry meters, that after a meter has been in use for a number of years, although it will register correctly, or nearly so, the quantity of gas passing through it when the full or a considerable quantity of burners are lighted, yet that it will not register the quantity of gas when three or four burners only are lighted. This arises, in my opinion, from the bearings becoming worn, and from the condensation of matters given off by the gas during its progress through the meter being deposited upon the valves." I have the same affidavits in substance from other persons, one being an inspector and tester of gas-meters for the northern and eastern portions of the metropolis.

Lord Chief Baron KELLY: My learned brethren who have heard your statement as to the effect of your affidavits think you should hand them up, and they will be considered by the court, and we shall be enabled to tell you on an early day whether we shall grant a rule.

Mr. HAWKINS: There is only one suggestion I have to make to the court. Of course I do not desire, on the part of the gas company, that this matter should be retried at the moment, and if you think it would be a convenient course to adopt, I should have no objection to the determination of your lordships whether the rule should be granted standing over until after that which inevitably will take place, the trial of another action, for in this very court there are five or six actions pending arising out of the same accident. It is quite impossible, if you refuse to grant this rule, that it should determine the matter, because involved in this action are sums of money amounting to between £70,000 and £80,000, and therefore the question must be investigated again. I have not the smallest objection, if your lordships please, having made this motion, to allow it to stand over till after another trial has taken place.

Lord Chief Baron KELLY: We will consider that suggestion also with due attention. Be so good as to hand up the whole of your affidavits.

Miscellaneous News.

THE *DAILY NEWS* ON LONDON GAS.

If twenty householders were picked at random out of a London street or suburb and told that they were personally responsible for the deficiencies in the lighting of their district, their censor would be probably met by a smile of incredulity. If the evils arising from the quality of the gas supplied, evils so constantly and so bitterly complained of, were laid at the same doors—if vitiated air, unwholesome rooms, spoilt goods, and pallid faces, were all charged upon our twenty typical scapegoats—they would cry aloud against the unjust and sweeping character of the charge. Yet it is a simple fact that, as the law stands, any vestry or district board of works, or any twenty inhabitant householders, may call upon the Home Secretary to remedy defects in the quantity or quality of their gas supply. That high official is bound, within one month of the receipt of the complaint, to appoint a competent person as inspector, who, after giving the peccant gas company 24 hours notice, shall examine works, machinery, and system of manufacture and supply. Fines and penalties are to be enforced if facilities are not given for this examination, and these are made heavier if the complaint is proved to be just. The Metropolis Gas Act, when confirming the division of London into districts, each to be supplied by only one company, sought to protect the consumer from the evils of monopoly by placing redress in his own hands, and by providing stringent rules for the government and regulation of the companies. Yet, in spite of these precautions, the complaints against our metropolitan gas arrangements are as helpless and vague as if we had been handed over tied and bound to irresponsible despots, who may sentence us to an atmosphere pure or vitiated, to light or twilight, dusk or darkness, without compunction or appeal. As usual, the fault lies with the public. Outside the City it does not appear that any attempt has been made to enforce the provisions of the Metropolis Gas Act against the companies; everybody's business has met its usual fate, and, after grumbling sorely and suffering much, we go on sullenly as we are, or take refuge in wax candles or moderator lamps. Yet gas should be the most convenient, the most economic, and the most brilliant of artificial lights; and as its advocates tell us it may be made the purest and most wholesome, it will be useful to consider how its partial unpopularity can be remedied, as well as the value of the schemes suggested for improving its supply. Among the most prominent of these has been the fusing the capitals of the different gas companies into one sum, that sum to be calculated not upon the money expended in the several undertakings, but upon the cost at which a new company could be formed, and then allowing dividends only upon the net capital as reduced. Apart from the apparent injustice of this proposal, it is not clear that the transfer of our gas supply from its present hands—another item in the scheme—would in itself be a benefit to the public.

London, we are told, is supplied with gas by thirteen companies, with an aggregate capital of six millions, besides the sums borrowed upon the credit of their undertakings. Up to the year 1857 these associations indulged in a competition which was ruinous to themselves and prejudicial to the public. When the mains or pipes of two or more companies were laid in the same thoroughfares, escapes of gas not unfrequently caused the pavements covering each set of pipes to be taken up to ascertain from which the escape came. This, added to the frequent interference with traffic and suspension of business through laying distinct mains and pipes, led to considerable dissatisfaction, and the companies out of the City finally agreed to confine themselves to separate districts. Liverpool, it may be mentioned, had adopted this principle some ten years before, when the two companies then supplying the town undertook to amalgamate, and sell gas at a specified rate, on the House of Commons rejecting an application fo an Act enabling a third company to enter into competition. There have been Acts for London fixing the price per 1000 feet and limiting dividends; Acts defining the number of wax candles and the number of candles of sperm to which the illuminating power of our gas should be equal; but matters are still held to be unsatisfactory, and consumers would gladly welcome a searching investigation into the quantity and quality of the London supply. Now it happens that the principal people concerned expressed their willingness last session to abide by the verdict of a scientific commission as to the degree of purity at which it is practicable to supply gas to the public, and it seems desirable that no further legislation should be attempted until this is done. It is maintained, too, that the existing mode of purification by peroxide of iron is as efficient a mode as can be adopted without making the act of purification itself a worse nuisance than it is; and that to attain a greater freedom from sulphur by the use of hydrate of lime would involve unpleasant smells, and, through necessitating alterations in the works, would raise the price of gas. The maximum of sulphur in that supplied now is said not to be more than 20 grains in every 100 feet; and the example of the South Kensington Museum is quoted to prove that this cannot be very injurious to property or life. A report upon the effect of the gas used there, and bearing the well-known names of Faraday, Tyndall, Hofmann, and others, was presented to the House in 1859. It was there stated that the gas supplied contained 22½ grains of sulphur in every 100 feet, but that the pictures remained uninjured; and that the mode of lighting might, with proper ventilation, be continued and increased with impunity. Accordingly, there are now some 4000 gaslights in use nightly at South Kensington.

But these arguments and examples, however conclusive theoretically, do not satisfy every-day people with every-day noses and eyes, and those 20 householders would do yeomen's service for the rest of us, who would exercise the right given them by law, and compel Mr. Walpole to obtain an authentic report from a qualified official inspector on the condition of our gas supply, and the causes which prevent its meeting the requirements of the day.

And what any twenty Britons may do for the districts in which they live it is to be hoped Parliament will do for the metropolis at large. Information is urgently required respecting our London gas supply, and few things have proved this more strongly than the proceedings before the select committee of last session. Some of the calculations it evoked were based upon the supposition that all existing forms of supply would obligingly disappear if an entirely new experiment were allowed to be carried out, and flattering statistics were authoritatively put forward, which were subsequently proved to be gratuitous and unsound. It is unnecessary at this time to canvass the advantages or demerits of a proposal to make a corporate body at once the manufacturers and vendors of gas and the supreme judges of its purity. We know that at Manchester and one or two other places in which the gas supply is in the hands of the local authorities it is satisfactorily managed; but our experience of metropolitan boards and vestries is not such as to encourage us to look to them for improved or enlightened control in social matters. The remedy for existing grievances is not a hap-hazard legislation which may involve us in evils a thousand-fold worse than those it is proposed to abrogate, but a careful and skilled examination into the merits of the case. The arrangements for lighting London are admitted to be susceptible of improvement. Reasonably or unreasonably, we all wish for an increase in efficiency and a reduction in cost, and our only chance of securing these advantages upon a reasonable and permanent basis is that we should understand what our rights and grievances really are. The drawback to mere parliamentary disputations upon such matters as the one before us is that they too often savour of advocacy, and are tinged with personal interest. This may be especially looked for when it is proposed to confiscate private property secured by previous Acts of Parliament as a sacrifice to the common good; and it is not wonderful that a suggestion which, if adopted, would have gravely prejudiced gigantic interests met with strenuous and successful opposition. All this, however, is beside the broad question of public convenience. We want to know whether existing complaints are well or ill founded, whether it is consumers who are unreasonable or the companies who are unfair, whether new legislation is needed or existing laws are only inoperative through indifference and disuse; and no attempt at change should be countenanced which is not preceded or accompanied by scientific and practical information, which shall be both-sided, impartial, and complete.

WINDSOR LOCAL BOARD.

FRIDAY, FEB. 1.

THE WINDSOR GAS COMPANY'S BILL.

At the Monthly Meeting of the Board, held at the Windsor Town-hall—F. K. COPELAND, Esq., Mayor, in the chair,

The CLERK (Mr. C. T. Phillips) reported that in accordance with the instructions of the board at its last meeting he had forwarded its resolutions to the gas company. He had received a reply from Mr. George Cartland, jun., the secretary to the company, stating that the directors, having considered the requirements of the Board of Health committee, and with the view of meeting the wishes of the board in a liberal spirit, had conceded two points—viz., that the illuminating power of the gas should be fixed at 14 candles, and that the interest on new capital should be limited to 7 per cent.; but that the directors had unanimously agreed to maintain the maximum price of gas at 5s. 6d. per 1000 feet, on the grounds previously stated.

Mr. CHAMBERLAIN was sorry that the board had forgotten one very important point in committee—that some provision should be made for limiting the price of gas for the supply of the public lights as well as to private consumers. If the gas company's bill passed, the board would be obliged to submit to any price that the company chose to impose. There should be some stipulation to protect the public interests.

Mr. POOLEY believed that the Act of Parliament of 1845 provided for the street-lamps being supplied at a limited price.

Mr. H. W. JONES reminded the board that legislation was for the benefit of future generations, for whose sake there ought to be some understanding, and the company ought not to be allowed to exceed present prices.

Mr. POOLEY rejoined that the company had to legislate for future directors, whatever contingency might arise. The company only intended to charge 5s. per 1000, but they thought they ought to have a sixpenny limit. With regard to the public lamps he could not say anything at present. The directors would rather lower the price than raise it; but it was very unfair to a trading company to screw them up to the last penny that could be got out of them. The directors had something to lose: gentlemen who advocated these extreme prices had only everything to gain. As a consumer he had more interest in the price being lowered than as a shareholder he could gain by its being raised.

The CLERK would not recommend the board to ask for a repeal of the clause in the Public Health Act which allowed the board to contract for certain periods.

Mr. DEVERKUX said that the board appeared to be dealing with a fair

company, and he was quite of Mr. Pooley's opinion, that in dealing with an honourable trading company the board ought not to screw them down to a penny. It was perfectly fair and reasonable that a trading company should have in case of contingency a margin of sixpence in any Act of Parliament. He would suggest that the board should remain in its present position.

Mr. CHAMBERLAIN said it was unfortunate that the gas company was so well represented, and the public so badly represented, at the board that morning. Several of the members of the board were directors, and the clerk was also solicitor to the company. The former should consider whether in the council chamber they were directors or trustees for the public. It would be remembered by the public by-and-by. Whilst they sat as trustees for the public their own interests ought to give way. Although not a shareholder in the gas company, his interests were bound up with it, but that circumstance with him sank into utter insignificance in considering what is best for the public good.

Mr. POOLEY: What is best and fair.

Mr. CHAMBERLAIN: What is best.

Mr. POOLEY: And fair.

Mr. CHAMBERLAIN: What is fair will be best. When Mr. Pooley understands as much about the coal trade as I do——

Mr. POOLEY: And you the gas trade.

Mr. CHAMBERLAIN would undertake to produce good gas at 4s. per 1000, and get a good profit out of it. The board should proceed with the utmost caution and circumspection, for if it held its peace the public would be altogether unprotected. If the board paid for the supply of the public lamps by meter, as at Reading, the public would be the gainers—there would be the chance of saving 25 per cent. on the public lights, as had been the case at Reading, where the meters had been in operation for the past three years with good effect, all parties being satisfied. At Reading the Local Board of Health fixed the times of turning off and turning on, and employed the men to do it; the gas company furnished the gas, he thought, at 2s. 10d. per 1000 feet. It was advisable that in the Windsor Gas Company's bill the board should have inserted a clause which should fix the maximum charge for the public lights, and he should propose a resolution to that effect.

Mr. H. W. JONES would like the bill to pass without opposition, if terms could be made; but the cost of going before the referees would not be much.

Mr. POOLEY was satisfied that in the Public Health Act there was a clause regulating the cost of the supply of gas to the public lamps.

Mr. MASON did not see why the gas company should have any objection to fix the maximum price they would charge for the supply of gas to the public lamps. The charge to the consumer was 5s. per 1000, and the company proposed to take power to charge 5s. 6d. The public lamps were lit at £3 5s. each. On that principle, adding 10 per cent., the company should be willing to concede the point, and to fix the maximum at £3 10s. He did not see why there should be any objection to that stipulation. It would be all *quid* and no *quo* if the board had to take the gas at any price that the gas company chose to fix.

Alderman JONES proposed, and ultimately it was resolved, that the terms offered in the communication from the gas company be agreed to.

Mr. CHAMBERLAIN next moved a resolution—"That the gas company be required to insert in their bill a clause which shall fix the maximum price to be charged for the supply of gas consumed in the public lamps, and which shall not exceed the price under the present contract."

Mr. H. W. JONES seconded the proposition, and mentioned that the town-clerk should watch the bill on behalf of the board.

The CLERK: Not so long as I have the honour to be the clerk to the board.

Mr. H. W. JONES maintained that before the parliamentary committees the town-clerk should act in this matter, considering that the clerk to the board was solicitor to the company.

Mr. CHAMBERLAIN concurred, as Mr. Phillips was debarred, by his position as solicitor to the company, from representing the board before the parliamentary committees on the gas bill.

Mr. DEVEREUX introduced an amendment, that did not meet with concurrence, inviting the gas company to send in a new tender for the supply of the public lamps.

Mr. POOLEY suggested an amendment; but Mr. H. W. JONES read the disqualifying clause, which prohibits a member voting at the board in any matter concerning a company in which he is a shareholder.

Mr. MASON would rather discuss the subject in a friendly way, and suggested that some communication be made to the gas company, inquiring the price proposed to be inserted in their bill, and intimating that the board would give it consideration, for there was plenty of time. At Slough the price was £3; at Windsor it was £3 5s.; so that the board might assume that the former was a fair price, which the Windsor Gas Company might adopt.

After some further conversation, Mr. Mason's suggestion was grafted on Mr. Chamberlain's resolution, which was carried, *nem dis.*, in this form:—"That the gas company be required to insert in their bill a clause which shall fix the maximum price to be charged for the supply of gas consumed in the public lamps, and which shall not exceed the price of £3 10s. per lamp."

DR. HILLIER'S REPORT ON THE GAS SUPPLIED BY THE IMPERIAL COMPANY TO THE VESTRY OF ST. PANCRAS DURING THE MONTH OF DECEMBER, 1866:—

Maximum light estimated by sperm candles according to the Act	15·3
Minimum light—sperm candles	13·8
Average light—sperm candles	14·3
Traces of ammonia, indicated by turmeric test-paper	Almost always.
Traces of sulphuretted hydrogen, indicated by lead test-paper	None.

The illuminating power of the gas has been good during the month of December. There has been an excess of ammonia on almost every occasion, but less than in some preceding months. There has been no sulphuretted hydrogen, and in 100 cubic feet of gas 17·1 grains of sulphur were detected. Throughout the year 1866 the illuminating power of the gas has ranged from 12·0 to 15·8 standard sperm candles. The monthly mean has been 13·81. There has been constantly an excess of ammonia. There has been no sulphur in the form of sulphuretted hydrogen, but in other combinations the mean of 12 monthly examinations has been above the standard laid down by the Act; in 100 cubic feet it has equalled 23·7 grains. This is an ingredient which ought not to be allowed in the gas beyond about 12 grains in the 100 cubic feet, and even this quantity is very undesirable. Since the peroxide of iron has been used to purify the gas instead of the hydrate of lime, there has been an increase in the amount of sulphur left in the gas. It does not appear that this increase is necessary, because it is not constantly observed even when the peroxide of iron is used. The chief objections to sulphur in the gas are that it rots leather, tarnishes silver, brass, and other metallic fittings, besides adding to the insalubrity of dwelling-rooms where gas is burnt. There has been an improvement in the gas in this respect since the unfavourable reports which I made in the beginning of the year, and I hope the improvement will be permanent, and that it may be even greater than before. It is sometimes supposed that, when gas blackens ceilings and renders chimney-glasses smoky more than usual, that this is a sign of impurity. This is not the case. As the illuminating power of gas is increased, it is more liable to cause smoke unless the burners are adapted to the quality of the gas, and if the pressure is not regulated.

ANALYSIS OF THE METROPOLITAN WATERS FOR JANUARY, 1867, BY PROFESSOR FRANKLAND, F.R.S., OF THE ROYAL COLLEGE OF CHEMISTRY.—The Registrar-General has to acknowledge the courtesy of the London water companies, who have furnished him with the average daily quantity of water supplied for the month of December, 1866: thus, according to their account, 427,331 cubic mètres of water, equal to about as many *tuns* by measure, *tons* by weight, were supplied daily; or 975 litres, rather less than a *ton* by weight, to each house, and 139 litres (= 30·7 gallons) to each person.

Names of Water Companies.	Number of Houses supplied in Dec., 1866.	Average daily supply of Water in Gallons during Month of Dec., 1866. (See note.)	Solid Matter in 100,000 part of the Waters.	Organic and other Volatile Matter included in column 4.	Amount of Oxygen required for oxidation of Organic Matter.	Total Hardness.
Thames Water Companies.						
Chelsea	26,783	7,786,200	31·34	2·39	·0532	18·5
West Middlesex	36,331	7,872,706	31·99	2·33	·0532	18·8
Southwark and Vauxhall	73,940	13,130,500	32·42	2·56	·0532	18·8
Grand Junction	26,450	8,650,150	32·82	1·28	·0597	19·4
Lambeth	37,165	8,819,100	31·88	2·32	·0597	19·4
Other Sources.						
Kent	33,693	6,149,006	39·40	1·22	·0223	22·5
New River	112,852	21,621,000	31·39	0·69	·0432	19·4
East London	90,174	19,842,000	35·68	2·64	·0727	20·5
South Essex*	910	183,497	37·93	3·02	·0140	22·2

* The secretary to the South Essex Water-Works Company writing in October, 1866, said—"We have not extended our mains at present west of Romford;" in other words, not to London.

Erratum in Return for November.—*For* 5,503,833 gallons (Kent Company) *read* 6,503,833 gallons.

Note.—The water includes the supply for manufactures and for various purposes other than domestic consumption. Total Number of Houses supplied, 438,298: average daily supply of water in December, 1866, 94,054,159 gallons. This return, as compared with that for the previous month, shows an increase of 160 houses and a decrease of 1,002,995 gallons of water supplied daily. The table may be read thus:—100,000 lbs. of the Chelsea water contained 31·34 lbs. of total impurity, of which 2·39 lbs. were driven off by incineration. 0·0532 lb. of oxygen was required to oxidize the organic matter. Of the solid residue 18·5 lbs. were carbonate of lime or its equivalent of hardening salts. The fourth column of this table contains the amount of solid matter left on evaporation and desiccation at 120 deg. C.—130 deg. C. (248 deg. F.—266 deg. F.). The results are recorded in 100,000 parts. By moving the decimal point one place to the right the above figures express in milligrammes the quantities contained in 1 kilogramme of the several waters.

The whole of the waters, with the exception of the New River Company's were slightly turbid when drawn from the companies mains; the Kent and South Essex Companies waters contained in suspension a quantity of white flocculi.

COMPOSITION AND QUALITY OF THE METROPOLITAN WATERS, IN JANUARY, 1867.—The following are the returns of the Metropolitan Association of Medical Officers of Health:—

Names of Water Companies.	Tot. solid Matter per gal.	Loss by Ignition*	Oxidizable Organic Matter.†	Hardness.	
				Before Boiling.	After Boiling.
Thames Water Companies.	Grains.	Grains.	Grains.	Degrees.	Degrees.
Grand Junction	23·50	1·00	0·84	14·0	5·0
West Middlesex	22·67	1·49	1·04	13·5	5·0
Southwark and Vauxhall	19·51	1·75	1·68	14·0	5·0
Chelsea	22·83	1·50	0·72	13·5	5·0
Lambeth	22·67	1·51	0·92	13·5	4·5
Other Companies.					
Kent	27·12	1·25	0·16	16·0	7·5
New River	21·75	2·00	0·84	14·0	5·5
East London	25·26	2·49	1·08	14·5	5·5
Surface Wells.					
Leadenhall Market	114·93	5·53	2·81	62·0	25·5
Bishopsgate Street	114·83	9·07	3·06	84·0	27·0

HY. LETHEBY, M.B.

* The loss by ignition represents a variety of volatile matters, as well as organic matter, as ammoniacal salts, moisture, and the volatile constituents of nitrates and nitrites.

† The oxidizable organic matter is determined by a standard solution of permanganate of potash—the available oxygen of which is to the organic matter as 1 is to 8; and the results are controlled by the examination of the colour of the water when seen through a glass tube two feet in length and two inches in diameter.

FIRE AT THE COLNBROOK GAS-WORKS.—On Monday, Jan. 21, about nine o'clock in the morning, an alarm was given through the town that the gas-works were on fire, and no time was lost by Mr. John Richardson and others in getting out the engine. The superintendent (Mr. A. Holderness), Mr. E. Weston, assistant, and the firemen were soon at their posts. The fire was confined to the roof of that portion of the works where the gas is made. Fortunately, Mr. Manders, the gas engineer and lessee, was present soon after the alarm was raised, and he at once shut off the gas and took other precautions to prevent the possibility of an explosion. All then set to work in right earnest, and by the excellent working powers of the engine and a good supply of water the flames were soon extinguished. Nothing could have exceeded the service rendered by our district engine, and those by whom it was managed. The fire appears to have been caused by a stoppage (owing to the frost) in the condenser. This caused tar to run over from the hydraulic main on to the furnace, and the flames thus occasioned set fire to the roof. The damage is estimated at something under £20. The works were not insured.

CHARGE OF TAMPERING WITH A GAS-METER AT WEYMOUTH.—At the Petty Sessions for the borough of Weymouth, on the 22nd ult., Benjamin Angel, dyer, of High Street, was summoned for defrauding the Weymouth Gas Company, by tampering with a meter.—Mr. Howard, who appeared for the plaintiffs, said the summons was taken out under the 10th Vict., c. 15, sec. 18, which was framed for the purpose of preventing consumers meddling with the meters on their premises so as to defraud gas companies.—Mr. Robert Church, the lessee and manager of the works, said, in consequence of a complaint made in August last of an escape of gas in the defendant's house, he had the meter taken away and examined. It was found that a small hole had been punched through the collar or boss; but this had no effect upon the working of the meter. The hole was soldered up, and the meter replaced the same day. On the 13th of December he sent a person to defendant's premises, who took the state of the index, which then registered a consumption of 74,900 cubic feet. The index was again taken on the 4th inst., and found to be the same. In consequence of this the meter was removed, and, when subsequently examined at the works of the company, a hole was discovered in the drum which would allow of the passage of gas without registration, and thus the company were defrauded.—In cross-examination by Mr. Welsford, who appeared for the defendant, witness said he was not aware of any complaint having been made at the office at the end of 1865 or beginning of 1866 by Mr. Angel. There was no hole in the drum of the meter when examined in August, nor could there have been up to the 13th of December, or the index would not have registered the consumption. The person who made it must have detached the inlet-pipe, and must have known what the effect of his act would be. He did not know the number of burners in defendant's house, but, supposing there to be only three, the quantity of gas registered between the 29th of September and the 13th of December was not equal to the average consumption. He met the defendant one day, who said something about the bill he owed, but made no complaint about the meter.—Thomas Hadley deposed to the fact of the meter being examined and the hole in the drum discovered. That hole could not have been made accidentally. The screw was not properly put in, and the collar was covered with red tape and soap, which showed that it was not the work of a fitter. The hole must have been made with the view of preventing the meter registering.—In cross-examination he stated that he observed soap on the meter on both occasions of taking the index, and that he spoke to the defendant as to the state of his fittings. On the second examination defendant said he had not burnt gas, but had been compelled to use paraffin lamps. Two or three nights after that witness and the clerk went to the defendant's shop and found the gas burning. There was nothing to prevent the meter working properly except the hole in the drum.—W. Frampton deposed to having examined the meter in August last, and finding it correct. He noticed the small hole in the boss at that time, and called Mr. Church's attention to it. After he had tested the meter, he screwed it up in a proper manner. When he put on the cap he used a leather collar, which ought to have been there when the meter was removed. Its absence showed that the meter had been tampered with.—Hadley was recalled, and, in answer to the mayor, said the collar was not on the union when he removed the fittings. He had no unfriendly feeling towards the defendant. He had had complaints from him respecting the gas, and had told him to make them at the office.—Mr. Welsford, for the defendant, said it was impossible for him to bring any evidence to rebut the charge, as he could not prove that the meter was not injured when it left his house. The only course, therefore, was to call evidence as to the defendant's character. His relatives occupied a respectable position in Jersey, and although the defendant had only been a short time in Weymouth, several persons were present who would speak favourably of him. His (Mr. Welsford's) instructions were, that about the month of November, 1865, the defendant commenced business in the town, and when he entered the premises in High Street there was a strong smell of gas. A man named Denman, who examined the meter, spoke to Frampton on the subject, but no notice was taken of the complaint, and in consequence of the smell continuing, and danger being apprehended, the defendant himself spoke to Mr. Church about it. A short time afterwards a lodger in the house complained of the escape of gas, and defendant, thinking he would find out where it came from, examined the meter and pipes with a candle, when an explosion took place, and his hair and whiskers were burned. As the lodger said he would not remain in the house unless something were done, they both went to the office to complain, but no one came to put the gas right, although defendant several times saw Mr. Church about it afterwards On the 24th of August the meter was repaired, and went very well for some time; but subsequently defendant had considerable trouble to get a supply of gas. A man who was then in Mr. Church's employ examined the meter. To do so he had to disconnect the piping, and some soap was put round the pipes, but the defendant had himself not touched the meter since it was repaired in August.—Mr. Church denied that the person referred to by Mr. Welsford was in his service at the time.—Mr. Lyon, the defendant's lodger, deposed to the smell of gas at the defendant's house, and to going with him to the gas office to complain; also to the use of paraffin lamps by the defendant.—Mr. Maryton deposed to having been present when defendant spoke to Mr. Church about the state of the meter at the beginning of this year.—Mr. Welsford tendered the evidence of the Rev. S. Ashton, but the mayor said he did not think it necessary, unless that gentleman could speak as to fact.—The magistrates then retired, and on their return, in a few minutes, dismissed the summons, as they did not think the evidence sufficient to convict the defendant of tampering with the meter. The mayor added that personally he considered it was sufficient to render the defendant liable, but he did not think the defendant had any knowledge that the meter was damaged.—Mr. Howard gave notice of appeal.

LIABILITY OF PUBLIC BODIES FOR NEGLIGENCE.—The Court of Exchequer has decided, in strict accordance with former decisions, that public bodies are liable for the acts of negligence of their servants, even although they have only public duties to perform, receive no payment, and have no funds out of which the damages can be paid. The vestry of Bermondsey were constructing a sewer in Blue Anchor Road, when a Mr. Juniper stumbled, in the dark, over a heap of dirt left by the workmen, and ultimately died of the injury so done to him. For this an action was brought under Lord Campbell's Act, and a verdict obtained for damages to the amount of £873. But how are they to be levied in such cases? Against whom is execution to issue where the defendants are a public body having no funds? Will the members of it be individually liable? If not, what is the worth of the verdict? If they are, who will undertake a gratuitous office for the public service? The subject demands immediate legislation.—*Law Times.*

PRESENTATION TO MR. C. WOODALL, OF STOCKTON.—At a meeting of the Town Council of Stockton-on-Tees, held on Friday, Feb. 1, it was proposed by Alderman Wren, chairman of the Gas Committee, and resolved—"That the thanks of the Town Council be awarded, together with a sum of one hundred guineas, to Mr. Woodall, the committee's engineer and manager, in acknowledgment of the able manner in which that gentleman has carried out the recent reconstruction and enlargement of the gas-works." Also—"That a copy of the above resolution be engrossed on vellum, and forwarded to Mr. Woodall under the corporate seal."

LIGHTING OF NORTH ORMSBY WITH GAS.—The town of North Ormsby, in Cleveland, was lighted with gas for the first time a few weeks ago. Like its neighbour, Middlesboro', North Ormsby owes its rise to the development of the Cleveland iron trade; it numbers some 3000 or 4000 inhabitants, though only commenced some 12 years since. The gas-works are the property of a limited company, and were designed and erected by Mr. Woodall, engineer to the Stockton Gas-Works.

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FOUR-WAY DISC GAS-VALVE

Is now in general use. It is equally applicable as a Purifier, Bye-pass, and Gasholder Valve (in which case only ONE PIPE INTO THE HOLDER IS NECESSARY). Its use effects a saving of from ONE-HALF to THREE-FOURTHS the number of ordinary valves and connexions depending on its application; and as there are no ground faces or rubbing surfaces, and foul gas does not affect it, *it cannot set fast however long it may remain unmoved.* The direction of the flow of the gas is also seen at a glance.

Descriptive Circular, Testimonials, and Prices furnished on application to the Manufacturers,

MESSRS. GUEST AND CHRIMES, ROTHERHAM.

BOROUGH OF SALFORD GAS COMMITTEE.

TO GASHOLDER BUILDERS.

THE Gas Committee of the Borough of Salford is prepared to receive TENDERS for the supply and erection on their Lamb Lane Works of a TELESCOPE GASHOLDER, 90 ft. in diameter and 24 ft. deep.

Plans and specification may be seen, and any further information obtained, on application to the Engineer on the Works.

The Committee do not bind themselves to accept the lowest or any tender.

Tenders to be delivered at the Gas-Works, Lamb Lane, on or before Monday the 18th inst., addressed to the Chairman of the Gas Committee, and endorsed "Tender for Telescope Gasholder."

By order,
G. BRETT, Town-Clerk.
Gas-Works, Salford, Feb. 1, 1867.

TO prevent complaints of inferior Gas, use the best FLINTSHIRE GAS CANNEL.

For contract supply, apply to STRANGE BROTHERS & Co., Gas Coal Merchants, Mold, FLINTSHIRE.

GREENSHIELDS' PATENT COMPOUND
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PRODUCING GAS AND COKE.

The Subscribers are now prepared to grant LICENCES by Bonus and Royalty to Gas Companies and others for making and using the above Compound, which Compound is considerably cheaper than the best gas coals, and is capable of being made to produce from 12,000 to 15,000 cubic feet of gas per ton, as required, with an illuminating power of great brilliancy and purity, and leaving a coke in every way suitable for fuel.

Further particulars may be learned on application to JAMES GREENSHIELDS & SON, 33, Virginia Street, GLASGOW.

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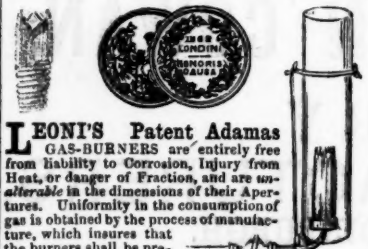

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Net Cash Price, 8s. per gross.

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would respectfully call the attention of engineers and managers of gas-works to his Newly Improved GAS-METER, patented 1862 in England, and the principal parts of the Continent.

Price-lists and tenders for gas-meters, experimental station-meters, experimental holders, governors, purifiers, gasholders, pressure-gauges, gas and water fittings, &c., are forwarded on application.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

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Information as to cost, &c., supplied gratuitously upon application to the advertiser, 42, Parliament Street, WESTMINSTER. [Office of the JOURNAL OF GAS LIGHTING, &c.]

PATENT ECONOMIZERS,
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Union Economizer,
1-10th real size of Flame.

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Ensure a large, well-shaped, steady flame. The aperture never wears out, thus attaining uniformity of consumption, great brilliancy of light, freedom from roaring, flickering, or waste of Gas, and no smell of sulphur. One gives more light than a triple-branch ordinary burner.

At the Expense of not quite One Penny for full five hours, a most cheerful light is obtained, surpassing the illuminating power of Twelve best Sperm Wax Lights.

The combustion is perfect; there is no escape of carbonic acid, carbon (or Soot), to discolour the ceiling, or injure the furniture.

All sizes kept in stock, suitable for cannel, mixed, and common gas, plug or taper screwed, to take the place of any old burner.

TESTIMONIAL.

Gas-Works, Portsea, January 2, 1867.

Dear Sirs,—I cordially respond to your invitation to give my opinion of your "ECONOMIZER." We have now not less than 8000 in use, all of No. 8 size, bat's-wing and fish-tails; and in no single instance have they failed to give a brilliant light, well-formed, and unaltered from day to day, with a minimum consumption of gas. Every gas engineer, who has had to struggle with the complaints of his customers, knowing them to arise solely from imperfect combustion of the gas for light-giving purposes, should introduce these burners, and he will find what I have found, universal satisfaction, in place of a great deal of discontent. On the other hand, the consumer will find it to his advantage to CONSUME his gas through this burner, as he will really get the value of what he is paying for. I can affirm with perfect confidence that this Company's consumers who now use this burner would not part with it if it cost six times as much.—I am, dear sirs, yours very truly,

J. DOUGLAS, Superintendent and Secretary,
Portsea Island Gaslight Company.

Messrs. Lambert Brothers, Walsall.

LAMBERT BROTHERS, Tube Mills, Gas-Fitting Manufactory,
WALSALL.

Agents supplied with Show-Cards and Tables of Consumption.

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JOSEPH BOULTON,
80, KING'S CROSS ROAD, AND
10½, GREAT PERCY STREET, CLERKENWELL.

Manufacturer of the Patent Dry and Improved Unvarying Water-Line Gas-Meters and Station-Meters, Governors, Experimental Meters, and Pressure Gauges, on the most improved principle.

Old Meters thoroughly repaired, and altered to meet the requirements of the Act of Parliament

ALL METERS WARRANTED.

JAMES MILNE & SON,
GAS ENGINEERS,
Gas-Meter, Gas Apparatus, and Gasfittings Manufacturers,
EDINBURGH, AND
2, KING EDWARD STREET,
NEWGATE STREET, LONDON.

Station-Meters, Governors, Consumers Meters, Gas Lustres, Chandeliers, Brackets, &c., and every description of Gasfittings and Gas Apparatus.

MARTIN'S
LEE MOOR PORCELAIN FIRE-BRICKS,

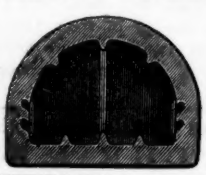
Containing no Lime, and only ·45 of Oxides, resist the strongest heats, and will last for Gas-Works longer than any others.

Samples and prices sent, and the highest references given, on application to

MARTIN BROTHERS,
ST. AUSTELL, CORNWALL.

FRASER'S PATENT RETORTS.

THE RIBBED IRON RETORTS



Have now been in use about three years, and continue to give satisfaction. The

PATENT CLAY RETORTS

Will work off the Gas from the Coal in less time, and Carbon does not form in them so freely, nor adhere so firmly, as to Plain Retorts.

Further particulars and prices on application to Mr. A. C. FRASER, Engineer to the Gas Company, COLCHESTER.

THE Advertiser, who has had several years experience with a Gas Company as CLERK and COLLECTOR, wishes to meet with a similar Situation. Good references.

Address X., Mr. C. New, Oak Bank, Broomhill, SHEFFIELD.

WANTED, a Situation as Manager of a Gas-Work. Is quite capable of taking the entire management, having practically acquired a thorough knowledge of the manufacture, distribution, laying mains, &c. Good references.

Address No. 2, Providence Terrace, Raglan Road, Woodhouse Moor, LEEDS.

WANTED, by a young Man, a Situation as CLERK. Has been for upwards of six years in gas companies offices.

Address A. B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

THE Advertiser desires an Engagement as ASSISTANT ENGINEER or MANAGER of Gas-Works, metropolitan or provincial. Is acquainted with the office and works routine. Testimonials very satisfactory.

Address E. A., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

A GENTLEMAN who has had considerable experience in the designing, erecting, and managing of Gas-Works, at home and abroad, desires to obtain another engagement as MANAGER or ACCOUNTANT to a Gas Company or Corporation. Has first-class testimonials, and can give security if required.

Address D. W., care of Mr. King, 11, Bolt Court FLEET STREET, E.C.

WANTED, a Situation as Manager in a small Gas-Work, or SUB-MANAGER or DRAUGHTSMAN in a large Gas-Work, by a young married Man, who has had long and good experience in gas engineering, and can show first-class testimonials.

Address D. S. A. 73, Mr. King, 11, Bolt Court, FLEET STREET, E.C.

MANAGER.

WANTED, by the Bromsgrove Gas Company, a WORKING MANAGER, capable of taking the whole management. Must thoroughly understand the manufacture of gas, and the general work required, including that of an exhauster by steam power, main and service laying. The Company will provide all necessary assistance in the shape of labour. The works being small, the manager will have the option of doing the consumers fittings, for which he will be paid extra. House, gas, and firing free.

Applications, stating salary required, with references, to be forwarded forthwith, addressed to Mr. GEORGE DIPPLE, Ford House, BROMSGROVE.

WANTED, by a young Man, a Situation as MANAGER of a small Gas-Work, or as Assistant in large works. Is experienced in every department; can also keep the books, collect the accounts of a Gas Company, and find security to any amount.

Address J. B. B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

COTTENHAM GAS-WORKS.

WANTED, a Manager for the Works at Cottenham, near Cambridge. He will have to make gas, take meters, lay service-pipes, and must be accustomed to take sole charge of a small Gas-Work. House, gas, and coals provided at the works.

Written application to be made to the Contractors, STEARS BROTHERS & Co., 3, George Street, HULL, stating age, wages required, also whether married or single, and giving reference to last employers.

THAXTED GAS-WORKS.

WANTED, a Manager for the Gas-Works at Thaxted, Essex. He will have to make gas, take meters, lay service-pipes, and must be accustomed to take sole charge of a small Gas-Work. Gas and coals provided.

Written application to be made to the Contractors, STEARS BROTHERS & Co., 3, George Street, HULL, stating age, wages required, whether married or single, and giving a reference to last employer.

WANTED, by a Gas Company in London, a SUB-INSPECTOR. He must understand service laying and meter fixing, and be generally conversant with the duties of such office.

Apply by letter, enclosing testimonials, addressed S. I., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C., not later than the 11th of February instant.

GAS MANAGER FOR BRAZIL.

THE Directors of the Bahia Gas Company, Limited, require a MANAGER to take charge of their Works at Bahia, in Brazil.

For further particulars, apply to the SECRETARY of the Company, at 3, Cloak Lane, Cannon Street, LONDON, E.C.

WANTED, a sober, active Man as GAS INSPECTOR, not over 30 years of age, and who is also competent to perform office work, taking indexes of meters, &c. Salary £100 per annum. Respectable references will be required.

Address, by letter, to G. P. HESTER, Esq., Solicitor to the Gas Company, OXFORD.

TO FOREMEN OF GAS-WORKS.

WANTED, a Man in the above capacity, for a Work about 100 miles from London, where the annual make of gas is under 30,000,000 feet.

Apply, stating full particulars, age, experience, and wages required, to ALPHA B., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

FOR SALE, a set of 4 Cast-Iron Dry-Lime PURIFIERS, 10 ft. square and 3 ft. 6 in. deep inside, together with hydraulic centre-valve for 10-in. connexions, and 2 sets of cast-iron girders, 46 ft. 3 in. long, with lifting crabs.

Also a 30,000 feet per hour BEALE'S EXHAUSTER, with 8-in. Walkers' valves.

A 12-in. PARKINSON'S STATION-GOVERNOR.

All in excellent order, and sold in consequence of larger being substituted.

Application to be made to the MANAGER of the Leicester Gas-Works.

FOR SALE.—Nine New Cast-Iron D RETORTS, each 8 ft. long; a large number of RETORT-HOUSE CONNEXIONS, 3, 4, and 5 in.; and a large number of Wrought-Iron LAMP-BRACKETS and STAYS.

Particulars can be had on application to the Cork Gas Consumers Company, Limited, 72, South Mall, CORK.

Jan. 4, 1867.

TO GAS COMPANIES & ENGINEERS.

TO BE SOLD, 2 3-throw Exhausters, with all connexions complete, each capable of passing upwards of 70,000 cubic feet per hour.

Also several VALVES, and sundry 8-in., 9-in., and 10-in. peculiar T's, Bends, &c.

The whole to be seen on the Works of the Independent Gas Company, at HAGGERSTONE, on application to Mr. R. J. LAING, Engineer and Manager.

CRICKLEWOOD & KILBURN GAS-WORKS.

TENDERS required for the erection of about 340 yards of OPEN PARK FENCING at the Company's Works, at Child's Hill, London, N.W.

Specification may be obtained of Messrs. STEARS BROTHERS & Co., Gas Engineers and Contractors, HULL.

TO GASHOLDER MAKERS AND CONTRACTORS.

THE Directors of the Colchester Gas Company are prepared to receive TENDERS for the supply and erection of a GASHOLDER, 120 ft. in diameter and 22 ft. in depth.

Specifications and drawings may be seen, and further information obtained, on application at the Company's Office, Queen Street, COLCHESTER.

By order of the Board,
A. C. FRASER,
Engineer and Secretary to the Company.

TENDERS are Wanted by the Directors of the Aldershot Gas and Water Company, for the PURCHASE of the almost new manufacturing plant of a small Gas-Work, capable of making 3,000,000 feet annually.

A preference will be given to any one taking the whole, which can be seen by applying at the Office, Bank Street, ALDERSHOT.

LIVESEY FIRE-CLAY WORKS,
NEAR BLACKBURN, LANCASHIRE.

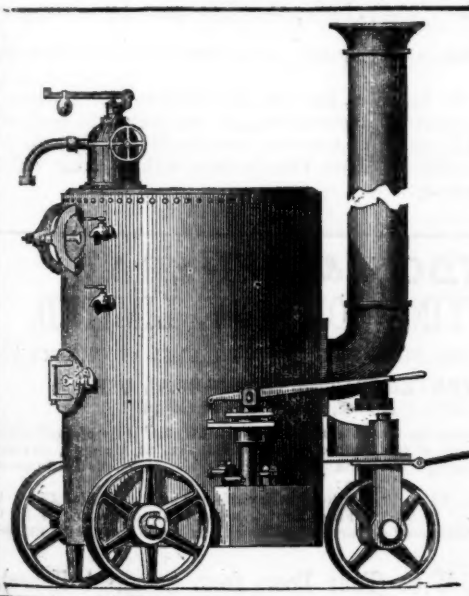
ORLANDO BROTHERS,

MANUFACTURER OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS.



PORTABLE STEAM BOILERS

FOR GAS-WORKS,

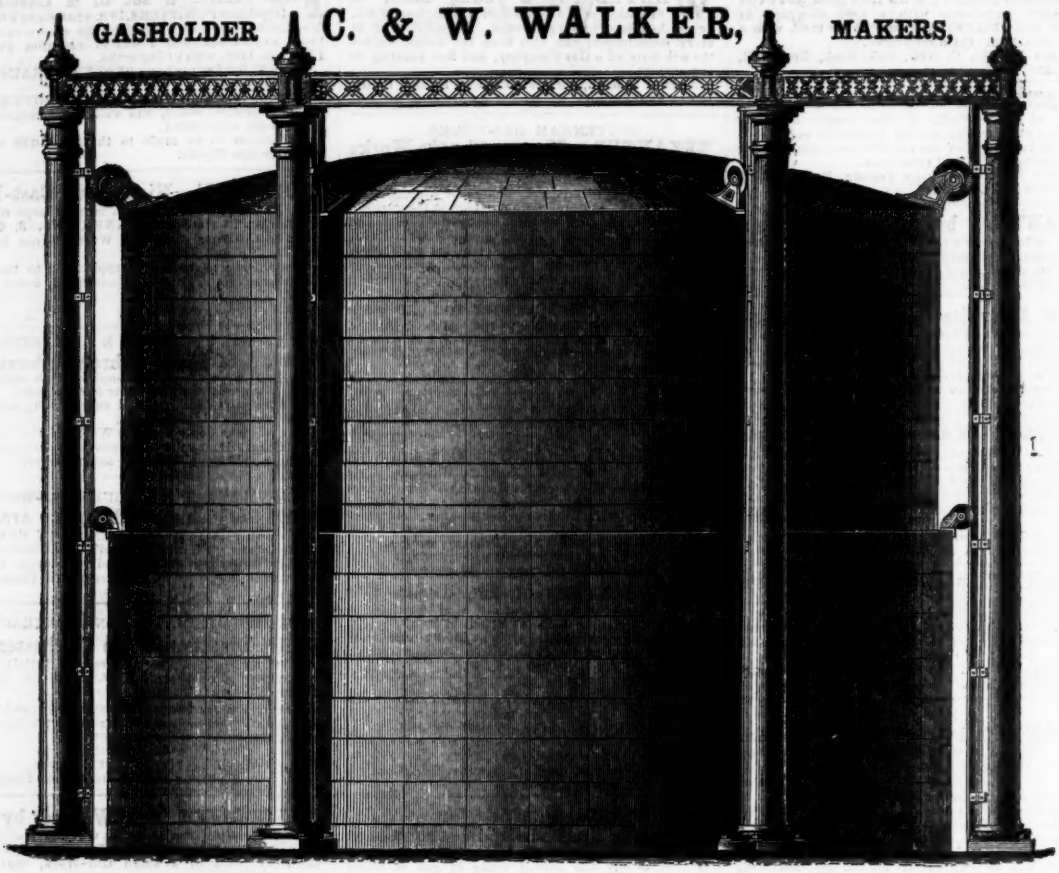
For driving a Steam-Engine for any purpose, thawing the frozen lutes of Telescope Gasholders, steaming and cleansing Condensers, Scrubbers, and the Pipes and Apparatus about the Gas-Works.

No. 1 size is 3 feet diameter.
No. 2 size is 2 feet diameter.

No Gas Company should be without so useful an implement, the entire cost being frequently saved in one winter.

C. & W. WALKER,
MIDLAND IRON-WORKS,
DONNINGTON, NEWPORT, SALOP.

GASHOLDER C. & W. WALKER, MAKERS,



MIDLAND IRON-WORKS, DONNINGTON, NEWPORT, SHROPSHIRE.

EDWARD COCKEY & SONS,

IRON-WORKS, FROME SELWOOD,

PATENT GAS-VALVES.

A PRIZE MEDAL

WAS AWARDED TO THE PATENTEES AT THE INTERNATIONAL EXHIBITION OF 1862.

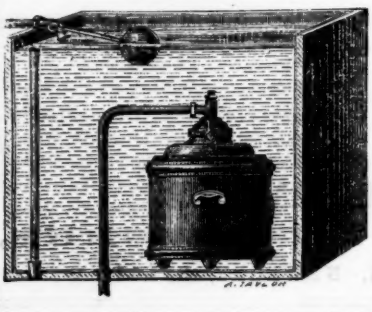
These Valves are formed of two cylinders, working one on the other horizontally, having their faces ground perfectly gas-tight.

They are adapted either as central valves, for two, three, or four purifiers—as bye-passes—or as inlet and outlet-valves for gasholders.

They have been fixed in some of the most important Gas-Works in the Kingdom, for more than eight years. Considerably over two hundred of them are now in use, and the most satisfactory reports of their advantages continue to be received. They are simple in construction, and not liable to get out of repair, and if in course of time the faces should leak, they can be easily re-ground and made as tight as ever, without removal from their positions. Each Valve is fitted with an index, which shows to the person in charge of the Works in what direction the gas is passing.

Frome, January 20, 1866.

HOUSE CISTERN FITTED WITH A CISTERN FILTER.



THE LONDON & GENERAL

WATER PURIFYING COMPANY, LIMITED.

PATENT CISTERN FILTER, CHARGED SOLELY WITH ANIMAL CHARCOAL.

THE LATEST PATENTED FILTER IN GENERAL USE,

And requiring, when once fixed, no attention whatever.

Patronized and used by Her Majesty the Queen at Osborne, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession, and at the Fusilier Guards, Middlesex, St. George's, German and London Hospitals, and at the Regent's Park and Tower Barracks, and numerous Institutions, Breweries, &c.

PRICES:

Filter No. 1, yielding ½ gall. p. minute. £1 10 0 | Filter No. 3, yielding 2 gall. p. minute. £3 0 0
Filter No. 2, yielding 1 gall. p. minute. 2 0 0 | Filter No. 4, yielding 4 gall. p. minute. 4 10 0

The Filters may be seen in operation, and full particulars obtained, on application to the SECRETARY, at the Offices,

157, STRAND, LONDON, W.C. (Four Doors from Somerset House).

KIRKWOOD CANNEL COAL.

This Coal is largely used in the Gas-Works at Glasgow, Paisley, Port Glasgow, Edinburgh, Leith, and many other towns throughout Scotland. It yields 10,648 cubic feet per ton; illuminating power, 27·55 standard candles; coke per ton, 9 cwt. 83 lbs. Railway communication from the pits (at Coatbridge) to all parts of the country; ports of shipment in Firths of Forth or Clyde.

For quotations, &c., apply to Mr. JOHN MACDONALD, 68, St. Vincent Street, GLASGOW.

FIRE-CLAY GAS-RETORTS, &c., CANNEL AND STEAM COALS.

WILLIAM FRASER, Inverkeithing

(owner of the Works at which Fire-clay Retorts were first made), having greatly enlarged his works, can supply retorts and other fire-clay goods to any extent.

References can be given to managers of above a hundred Gas-Works whom he supplies.

WILLIAM FRASER ships COWDENBEATH PARROT COALS at Charlestown and Burntisland at 11s. per ton; and HALBEATH STEAM COAL on Navy List, at 8s. 6d. per ton.

JAMES OAKES and CO.,

ALFRETON IRON WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,

Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water-Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.

N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.

CHARLES HORSLEY, Agent.

OXIDE OF IRON,

We are prepared to supply, on moderate terms,

HYDRATED PEROXIDE OF IRON (BOG OCHRE),

Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.

FRANCIS RITCHIE & SONS,
BELFAST.

INTERNATIONAL EXHIBITION,
1862. CLASS X.
PRIZE MEDAL

For excellence of Fire-Clay Gas Retorts, and "HONOURABLE MENTION" for good quality of Fire-Bricks.

WILLIAM STEPHENSON & SONS,
THROCKLEY,
NEWCASTLE-ON-TYNE.

THOMAS CARR & SON,

MANUFACTURERS OF

FIRE-BRICKS, LUMPS, TILES, RETORTS, &c. &c.

SCOTSWOOD FIRE-BRICK WORKS,
NEAR
BLAYDON-ON-TYNE.

ADDISON POTTER,

WILLINGTON QUAY,
NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of Clay Retorts, Fire-Bricks, and every description of Fire-Clay Goods.

HARRIS and PEARSON,

PROPRIETORS OF

BEST CLASS-HOUSE POT AND CRUCIBLE CLAY

MANUFACTURERS OF

FIRE BRICKS, GAS RETORTS, &C.

AMBLECOTE FIRE CLAY AND BRICK WORKS,
STOURBRIDGE.

Late in the occupation of I. and W. King. Originally J. Pidcock, Esq.

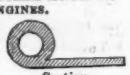
NB A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches. 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

HANCOCK'S INDIA-RUBBER GAS-TUBING.

All sizes, from ¼ in. to 4 in. diameter and upwards.

Also,

HORSE SINGEING APPARATUS, best make, with GAS-BURNERS, COMBS, and INDIA-RUBBER TUBING, all complete.
INDIA-RUBBER BAGS for GAS-MAINS.
WASHERS for GAS and STEAM JOINTS.
VALVES (pure solid Rubber) for STEAM-ENGINES.
PACKING (Elastic) for STEAM-ENGINES.
FLANGE TUBING, for excluding Draughts and Dust through WINDOWS, DOORS, and GLASS CASES.



Section.

Illustrated Price Lists on application.

JAMES LYNE HANCOCK,
Vulcanized India-Rubber Works,
GOSWELL MEWS, AND 266, GOSWELL ROAD
LONDON, E.C.

Trade Mark. THE MEDAL FOR 1862.

THE ONLY PRIZE MEDAL AWARDED FOR TUBES AND FITTINGS.

CROWN TUBE-WORKS,
WEDNESBURY, STAFFORDSHIRE.
WAREHOUSE—81, UPPER GROUND ST., LONDON.

JAMES RUSSELL & SONS,
Patentees and First Makers of Wrought-Iron Tubes.

MR. G. W. STEVENSON, C.E., F.G.S.,

(for the last 10 years Engineer to the Corporation of Halifax), may be consulted upon all matters connected with the construction of gas-works, and the manufacture and supply of gas; also upon the construction of water-works and the supply of water to towns; and also in respect to the sewerage of towns, and sanitary works generally.

OFFICE: 14, Park Street, WESTMINSTER.

ALFRED PENNY, Gas and CONSULTING ENGINEER,

WENLOCK IRON WORKS,

21, WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.

Plans, Specifications, and Estimates prepared.

W. J. HOLLANDS,

IRON MERCHANT,

31, BANKSIDE, LONDON, S.E.

SOCKET, FLANGE, HOT-WATER PIPES, AND ALL CONNEXIONS; RETORTS, HYDRAULIC MAIN, LAMP-COLUMNS, &c.; AND EVERY DESCRIPTION OF CASTINGS AND WROUGHT-IRON-WORK FOR GAS AND WATER-WORKS, STEAM, AND GENERAL PURPOSES.

N.B.—All goods kept in stock, and supplied at wholesale prices. Estimates given, and orders by post punctually attended to the same day.

BIRTLEY IRON WORKS,

CHESTER-LE-STREET,
DURHAM.

Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications, addressed to J. SUGG and Co., GHENT, will receive immediate attention.

D. BRUCE PEEBLES,

Gas-Meter Manufacturer,

FOUNTAINBRIDGE,

EDINBURGH.

FREDERICK RICHARDS,

CONSULTING AND GENERAL ENGINEER.

WILMSLOW, CHESHIRE.

Plans, Specifications, and Estimates made for New or the Alteration of existing Gas-Works.

Gas-Works leased, or Estimates given for the Manufacture of Gas per Contract for a term of years.

Manchester Office: 8, Cateaton Street.

BEST AND HOBSON,

LATE

ROBERT BEST,

100, CHARLOTTE STREET, BIRMINGHAM,

Manufacturers of

CHANDELIERS, PENDANTS, BRACKETS,

Brass and Iron Gas-Fittings, Steam and Water-Cock &c., &c.

Also,

PATENT WELDED IRON TUBES,

For Gas, Steam, Water, and other purposes.

GAS APPARATUS OF EVERY DESCRIPTION.

High-pressure Water-Valves and Cocks, &c., &c.

Plumbers Brassfoundry,

BRASS, COPPER, COMPOSITION, AND LEAD TUBES.

Works: Birmingham, and Great Bridge, Staffordshire.

D. GRANT & CO.,

GAS-METER MANUFACTURERS.

STATION-METERS ANY SIZE.

PHOTOMETERS, EXPERIMENTAL METERS, PRESSURE-GAUGES, &c.

Price List on application.

GAS-METER WORKS, CROSSCAUSEWAY, EDINBURGH.

STOURBRIDGE FIRE-CLAY WORKS.

E. BAKER & CO.,

24 WHARF, HARROW ROAD, PADDINGTON, W.

FIRE-BRICKS, LUMPS, SQUARES, and TILES of all dimensions.

GAS-RETORTS always in stock.
GARDEN EDGINGS of various patterns.
ORNAMENTAL BUILDING BRICKS.
GRATE BACKS in various designs.

Contracts entered into to set Retorts, erect Furnaces, &c.

Shipments on the shortest notice.

JAMES NEWTON & SONS,
(Established 1820,)

FIRE-BRICK AND TILE MERCHANTS,

Wholesale and for Exportation,

FALCON DOCK, 78 AND 79, BANKSIDE,
SOUTHWARK, LONDON, S.E.,

DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for

GAS AND WATER WORKS.

B. CARPENTER'S Improved Wood SIEVES for Gas-Purifiers.

Works: 14, John Street, Pentonville Road, LONDON, N.

The above sieves are used by the principal gas companies in London and the country. Their utility, durability, and cheapness combined, render them superior to all others.

Testimonials from gas engineers who have tested their qualities forwarded on application.

All orders punctually attended to, and estimates given if required.

CAST-IRON Retorts, Socket Pipes, with Syphons and all requisite Connexions, Lamp Columns, Wrought Iron Tubing, Valves, Street Lamps, Sight Holes, Furnace Doors, Ash Pans, Charging and Coke Shovels, Iron Pails and Coke Barrows, Cross Bars, Fire Pots, Pumps, Iron Borings.

PURIFIERS, CONDENSERS, and SCRUBBERS erected complete, or the materials supplied; with every description of goods in use by Gas-Works, in stock, on wholesale prices, at

Mr. LYNCH WHITE'S,
Old Barge Iron Wharf, Upper Ground Street,
LONDON.

J. T. B. PORTER & CO.,

GAS ENGINEERS,

MANUFACTURERS AND CONTRACTORS FOR GAS-WORKS

Of any extent at Home and Abroad,

GOWTS BRIDGE WORKS, LINCOLN,
AND
JOHN STREET, ADELPHI, LONDON, W.C.

SAMUEL CUTLER, Gasholder MAKER and CONTRACTOR

For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.

PROVIDENCE IRON WORKS,
MILL WALL, POPLAR, LONDON, E.
Main Laying and Gas-Works erected complete.

JAMES M'KELVIE,

CANNEL COAL MERCHANT,

HAYMARKET,

EDINBURGH.

Established 1840.

WALTER MABON & CO.,

Engineers,

ARDWICK IRON-WORKS,

FAIRFIELD STREET, MANCHESTER,

MANUFACTURERS OF

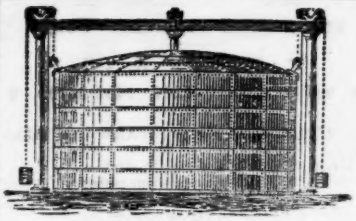
IRON TANKS, GASHOLDERS,
GAS APPARATUS,
PIPES, VALVES, IRON ROOFS,
WROUGHT AND CAST-IRON GIRDERS.

DESIGNS, SPECIFICATIONS, & ESTIMATES FURNISHED.

GAS AND WATER PIPES.

CLARIDGE, NORTH, & CO.,

BILSTON.



IMPROVED GAS APPARATUS,

FOR TOWNS, VILLAGES, &c.

INVENTED AND MANUFACTURED BY

W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD.

WILL BE SENT ON APPLICATION:—

PLANS, SPECIFICATIONS, and PRICES of GAS APPARATUS;

PLANS, SPECIFICATIONS, and ESTIMATES of the requisite BUILDINGS for each size of Apparatus;

PLANS of the IMPROVED ANNULAR CONDENSERS;

PLANS of the COMBINED PURIFYING APPARATUS, so eminently adapted for Exportation.

LONDON OFFICES—56, GRACECHURCH STREET, CITY.

*** *Please address letters to the Works at Huddersfield.*

NOTICE OF REMOVAL.

THE BUSINESS OF

WILLIAM SUGG,

GAS ENGINEER,

is removed to his New Factory,

VINCENT WORKS, VINCENT STREET,

REGENT STREET, WESTMINSTER.

WILLIAM INGHAM AND SONS,

WORTLEY FIRE-BRICK AND RETORT WORKS,

Near

Leeds.

W. INGHAM and SONS, having for many years been extensively engaged in the Manufacture of

RETORTS AND FIRE-BRICKS FROM THE CELEBRATED WORTLEY FIRE-CLAY

beg to call especial attention to their RETORTS, which have for many seasons proved to be unsurpassed in quality by any in the Kingdom, their FREEDOM FROM CRACKS and the ADHESION OF CARBON rendering them worthy the attention of all parties interested in the making of Gas.

The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

Estimates for Setting, or Bricklayers sent when required.

GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

A large stock of Fire-Bricks, Fire-Clay, Terra Cotta, and Drain-Pipes of all sizes kept in London at CHRISTIE & CO.'s Wharf, 64, Bankside, Southwark, where all particulars of Prices, &c., may be obtained.

N.B.—*Export orders continue to have prompt attention.*

KING BROTHERS,

STOURBRIDGE FIRE-BRICK AND RETORT WORKS.

KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them FREE FROM CRACKS AND CORRECT IN FORM. By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

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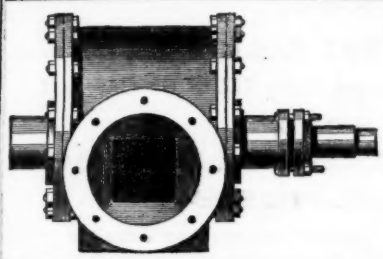

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